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NEW METALLURGICAL TEXT-BOOK.

METALLURGY: the Art of Extracting Metals from their Ores, and Adapting them to Various Purposes of Manufacture. By JOHN PERCY, M.D., F.R.S., Lecturer on Metallurgy at the Government School of Mines. London: John Murray, Albemarle-street.

The want of a treatise upon metallurgy, to which the student could refer with confidence, and which would likewise be of utility to the practical smelter, has long been acknowledged, but the work now before us, from the pen of Dr. Percy, appears in every way calculated to remove the necessity for any complaints for the future; not only has the author afforded convincing proof that he has given his readers the full advantage of his long connection with practical metallurgy, but he has also, through his intimate acquaintance with continental languages, been able to render the researches of the most celebrated French, German, and Swedish metallurgists available to them. As Dr. Percy very justly remarks, British metallurgists have contributed but little to metallurgical literature, but this should not lead to the erroneous conclusion that our smelters are too ignorant of chemistry to understand the theory of the processes under their direction, or too illiterate to be able to record the results of their experience. The chief writers on metallurgy are the Germans, and we are probably indebted to them to a much greater extent than is commonly supposed for the development of our mineral resources since the introduction, about three centuries ago, of German miners and metallurgists, through the wisdom of Elizabeth. Throughout the work the doctor evinces a strong desire to acknowledge the obligations he is under to the writers who have preceded him, and to all from whom he has received assistance, so that the work has the advantage, as well as being a valuable text-book, of forming a ready guide to the best authorities upon any given matter of detail. To allude to the utility of a work by an author enjoying such a position in the scientific world as Dr. Percy were almost superfluous, did it not so frequently happen that men best acquainted with the subject they teach are least able to commit their observations to writing in a concise and readily intelligible manner. The vast amount of information obtainable from following a course of Dr. Percy's lectures is well known, and with regard to his book more can scarcely be said in its praise than that the method of arrangement which he has adopted in the work is nearly the same as that which he has followed in his lectures, and which, so far as relates to the instruction of students, has thoroughly succeeded.

In the volume before us, Dr. Percy has treated the subjects of fuel, fire-clays, copper, zinc, and brass ably and exhaustively, reserving iron, lead, silver, gold, platinum, nickel, cobalt, arsenic, bismuth, antimony, tin, mercury, &c., for a second and concluding volume. After defining the science of metallurgy, the author arranges the metals into classes according as they are fusible below redness, as tin and lead; fusible above redness, but at temperatures easily attainable in furnaces, as copper and gold; fusible only at the highest temperatures attainable in furnaces, as nickel and manganese; and practically infusible, at least in ordinary furnaces, as platinum and iridium. Metals are either fixed or volatile by heat; the fixed metals are gold, copper, nickel, &c., and the volatile metals are, after fusion, cadmium, zinc, &c.; and without fusion, passing directly from the solid to the gaseous state, arsenic. Dr. Percy then explains that the specific gravity of metals at the ordinary temperature ranges between 0.6 and 21.5; how the crystallisation of metals is effected by slow and by rapid cooling; the varieties of fracture; as well as the malleability, ductility, tenacity, conduction, &c., of the several metals. By this means the reader is well prepared for the General Considerations of Metallurgical Processes, to which he is next introduced. The term ore is applied to the metalliferous matter in the state in which it is extracted from the earth by the miner. Metals occur in the earth either in the metallic state or in the state of chemical combination, as sulphides, oxides, and carbonates, or more rarely as arsenides, chlorides, sulphates, phosphates, and silicates. The term native is used to express their occurrence in the metallic state; thus gold and platinum occur native. Native metals are not necessarily pure; thus no instance is recorded of native gold free from silver. Ores exist in the earth either in veins or beds, and it may be convenient for the sake of brevity to designate as extraneous matter everything in the ore except the metallic mineral species which is the object of search by the miner. This extraneous matter is separated in a greater or less degree by the mechanical processes of dressing practised at the mines, and the ore may then be regarded as ready for the smelter. Metallurgical processes may be divided into dry and wet, according as they are conducted, without or with the agency of liquid reagents; in some instances a metal is extracted by a combination of dry and wet processes. The various kinds of metallurgical processes, continues Dr. Percy, may be classified as those in which the separation of the metal is without fusion of the ore, subdivided into the direct without reduction, and the indirect with reduction; and those in which the separation of the metal is with fusion of the ore subdivided into the processes involving simple fusion (simple reduction with fusion), reduction with volatilisation of the metal, and reduction by complex processes with fusion. The various processes of reduction, smelting, roasting, distillation, sublimation, and lixiviation, are then in turn explained. Slags, their atomic constitution, external characters, and fusibility come next under consideration, and upon this subject Dr. Percy affords a large amount of minute details, which may possibly prove serviceable to those desirous of converting the enormous quantity of slags now wasted to useful purpose.

The general consideration of metallurgical processes being disposed of, Dr. Percy next proceeds to make his readers intimately acquainted with the various qualities of fuel—the chapter being at once of the greatest scientific and practical value. After a few interesting general remarks, the calorific power of fuel is treated of—Rumford's experiments, the researches of Favre and Silbermann, and Berthier's process of estimating the calorific power of fuel being fully described. The several descriptions of fuel are then classified—wood, peat, coal, charcoal, and coke, and the various kinds of each are particularised and explained, in order that the student may ascertain the relative merits and demerits of each. The nature and value of fuel being thoroughly understood, the student is well prepared for the succeeding chapter on the Natural Refractory Materials employed in the construction of crucibles, retorts, and furnaces, which completes what may be described as his preliminary instruction—his preparation to converting the metal contained in the ore into a marketable product being then complete. Fire-clays are first considered, the variation in their composition being duly noted, and analyses given of a very large number of British and foreign fire-clays. Then follows an interesting paper on crucibles, the various kinds of crucibles being described, and their relative merits explained. The Cornish crucibles of Juleff, of Redruth, and Mitchell, of

Truro, the London crucibles of Ruel, and the white fluxing-pots of the Plumbago Crucible Company being highly commended; as are Ruel's black lead crucibles. Several ingenious little crucible moulds are then described, and as crucibles would be little worth without a means of melting their contents, the doctor gives accurate mechanical drawings of Sefström's blast-furnace, which has already been referred to in the *Mining Journal* as particularly suited to laboratory purposes, and of Deville's furnaces, so useful for obtaining high temperatures.

We now arrive at the treatment of the ores themselves, copper being the first metal of which Dr. Percy treats. The history of copper, and the various conditions under which it exists in nature and in the laboratory being fully explained, the reader is given a very interesting series of historical notices on Copper Smelting in Great Britain. The manufacture of copper near Llandudno, by the Romans; the working of a rich copper mine at Keswick, in Cumberland, by the Earl of Northumberland, in the time of Elizabeth; the fact that our ancestors imported copper from Hungary and Sweden, and allowed calamine to be exported as ballast; the copper-works of Yorkshire, Staffordshire, and Lancashire, at Bristol, and in the earlier period of copper smelting in Cornwall, are each referred to, and the entire chapter rendered thoroughly acceptable both to the technical and general reader. Dr. Percy extracts a morsel from De Dunstanville's edition of Carew's "Survey of Cornwall," written about 1739, which cannot be passed over without notice. Even at that time the smelters' earnest desire to defraud the miner is commented upon; and as a similar view is expressed by more recent writers—indeed, by the majority of those who are supposed to be writing in the interest of the miners, it would almost seem that the minds of Cornishmen have become so impregnated with the idea that everyone is desirous of cheating them, that they are unable to discern whether or not they have cause of complaint. In referring to the establishment, in 1754, of copper-works at Enl, Price remarks that "the (copper) companies left no method unsought to traduce the credit and stab the vitals of this undertaking;" yet, as Dr. Percy remarks, "as the adventurers felt themselves so much aggrieved by the smelters, they might have entered into a combination to keep up the price of ore." The fact is, the miners are paid fairly for their ore, and that the smelters do not receive a larger profit than they are entitled to, considering the immense capital at stake, and the ordinary risks of business, and we opine that no benefit could result to the miners from attempts to smelt their own ore. Dr. Percy carefully describes the treatment of the ore from the time it leaves the mine until it is ready for the smelter, and continues it through the various smelting processes, until it reaches the marketable condition. The most approved forms of furnaces are described and illustrated by drawings which would be ample for the purposes of the furnace builder. The description of the smelting processes has not, we think, upon any previous occasion been so minutely and accurately given as by Dr. Percy. Not only is the Welsh process described, but also the various other processes in use, amongst them the system of smelting in blast-furnaces, the kern roasting at Agordo, &c., the consideration of the treatment of copper being concluded by ample details concerning the assaying of copper ores by the Cornish method.

The history of zinc is given in a very concise and readable form, yet contains a vast amount of information. Though giving all credit to Basil Valentine, Paracelsus, and Albertus Magnus, the author remarks that from the following passage, which occurs in Strabo, one might at first almost be disposed to conjecture that zinc, in its metallic state, was not unknown to the ancients:—"There is a stone near Andeira which, being burnt, becomes iron; afterwards, when melted in a furnace with a certain earth, it drops false-silver, which, with the addition of copper, produces what is called the mixture, and which some name orichalcum. False-silver is also found in the neighbourhood of Tenolus." He refers to the arguments for and against the assumption that this false-silver was zinc, but offers no opinion on the subject; for ourselves, we should incline to the opinion that it was zinc, though whether produced from the stone found at Andeira or the "certain earth," it seems impossible to form an opinion. Calamine was formerly pretty abundant in England; it is stated that, in about the middle of the 17th century calamine brass-works were erected in Surrey by Demetrius, a German, at an outlay of 6000*l.*, and that a good profit was realised. But British and foreign merchants combined against the proprietor, and involved him in lawsuits; and meeting with no encouragement, he was at last ruined, and was compelled to abandon the works, "to the unspeakable prejudice of the kingdom." Calamine brass-works were established in Bristol about 1702, and afterwards at Cheadle, in Staffordshire, about 1720. It must not, however, be supposed, from our selecting these interesting little extracts from Dr. Percy's work, that he has sacrificed utility to make a readable book; these historical sketches are merely given as an introduction to the technical portions of the chapters on the several metals, and the reading of them can but increase the student's interest in the subject, and cause him to pursue his studies with greater zest. Dr. Percy minutely describes the physical and chemical properties of zinc, as well as the various classes of ore from which it is obtained. The English process of extracting zinc is given at some length; then the Silesian, Belgian, and Cornish processes are explained; after which the various methods of extracting zinc are compared with each other, and the alleged improvements in the extraction of zinc are carefully considered; the treatise being closed by an elaborate exposition of the methods of assaying the ores of zinc.

In treating of brass, Dr. Percy confines himself to the alloys of copper and zinc, but it should, he remarks, be more properly confined to such as are either decidedly yellow or have the yellowish tint characteristic of brass. In a subsequent part of the work, he will examine the subject of the constitution of alloys, so that the study may be rendered more agreeable. After explaining the value, malleability, crystals, process of stamping, &c., of brass, he describes the qualities of various alloys of copper and zinc. The preparation of brass is next treated of, the mode of manufacturing calamine brass being first considered, and then the process of direct preparation by adding metallic zinc when the copper has been just melted in the crucible or reverberatory furnace. A few miscellaneous observations on brass, showing how brass especially suited for any particular purpose may be obtained, and explaining the modes of annealing, lacquering, &c., brings the volume to a close. Regarding the work in its entirety, we have no hesitation in stating that as a Text-Book on Metallurgy Dr. Percy's treatise, so far as regards the metals treated of, is unsurpassed by any which we have seen in English, French, or German, and that it is particularly adapted to the requirements both of the student and the practical smelter. It is arranged upon that admirable system which first affords the reader a general view of the subject he is about to study, and then leads him to the minutest details—a system which we are convinced is the only one that can be confidently relied upon by those really desirous of acquiring knowledge themselves, or of imparting it to others.

HISTORY OF CIVIL ENGINEERING.

LIVES OF THE ENGINEERS: with an Account of their Principal Works: comprising also a History of Inland Communication in Britain. By SAMUEL SMILES. London: John Murray, Albemarle-street.

To be enabled to produce a book which has at once the conciseness necessary to render it valuable to the professional man, and the interesting character which makes it acceptable to the general reader, requires a power not very generally possessed by authors, yet one which, when possessed and exercised, is sure to be appreciated. In his "Lives of the Engineers" Mr. Smiles has displayed all the abilities of a good popular writer, without, however, rambling into those paths which render a popular book worthless as a work of reference. The information is clear and concise, yet it is so interspersed with anecdotes, poetical scraps, and interesting notes, not to mention the innumerable and admirably executed engravings of some of the greatest architectural beauties and curiosities in the kingdom, that the work will undoubtedly be read with pleasure by every member of the community within whose reach it comes. In volumes such as those of Mr. Smiles's, it is difficult to select examples wherewith to give an idea of the precise nature of the book; for whether we look at the historical, the biographical, or the technical portions of the work, we find much that is worthy of especial notice. Nor are we much more successful when we attempt to confine ourselves to the matter strictly connected with mining pursuits, for we have the history of Sir Hugh Myddelton's connection with the mines of Cardiganshire; the history of Brindley's connection with collieries; the history of Sir Francis Drake's great enterprise for supplying Plymouth with water; an interesting account of the antiquities of Dartmoor; an account of the first wade bridge over the Camel, and numerous other really excellent treatises.

Passing over the pedigree of Hugh Myddelton, we find that he commenced life as an apprentice of the guild of the Goldsmiths' Company. His great work—the New River, for supplying London with pure water, was his first enterprise in connection with engineering, and his next was the embarkment of Brading Haven; but his parliamentary connection with his native town of Denbigh afterwards made him acquainted with the mining enterprise then on foot in different parts of Wales, so rich in ores of copper, lead, and iron. It appears that the Governor and Company of Mines Royal in Cardiganshire were incorporated in 1604, for the purpose of working the lead and silver mines of that county. The principal were those at Cwmsymlog and the Darren Hills, situated about midway between Aberystwith and the estuary at the mouth of the River Dorey; they were at Skibery Cood. For many years these mines were worked by the Mines Royal Company with little success. Although there was plenty of ore, the mines were so drowned with water that the metal could not well be got at and worked out. Here Myddelton's engineering skill was again displayed. The Mines Royal Company, too glad to get rid of their unprofitable undertaking, agreed to farm it to Sir Hugh for 400*l.* per annum. It took him some time to clear the mines of water, which he did by pumping machines of his own contrivance; but at length sufficient ore was raised to enable it to be tested, and it was then found to contain a considerable proportion of silver. His operations seem to have been attended with success, for we shortly find him sending considerable quantities of silver to the Royal Mint to be coined. King James was so much gratified by Myddelton's skill and enterprise that he raised him to the dignity of a baronet, and, as a further compliment, directed that he should be discharged from all customary fees, amounting to 1095*l.*; and amongst the reasons and considerations for the grant of the dignity we find that one is "For finding out with a fortunate and prosperous skill, exceeding industry, and no small charge in the county of Cardigan a royal and rich myne, from which he hath extracted many silver plates, which have been coined in the Tower of London for current money of England." Beyond this, the king waived all claim to royalty on the silver raised by Myddelton, though the lessee who succeeded Sir Hugh paid royalty into the State Exchequer. As an entire chapter is devoted to Myddelton's Mining Enterprise in Wales, we must let this brief abstract, showing the character of the information, suffice, remarking, however, that the chapter contains a vast amount of information, and is rendered more interesting by being illustrated by rare engravings of the early mining works in Wales. Several reports which have been circulated with reference to Myddelton are shown by Mr. Smiles to be without foundation, not the least important contradiction being that with reference to the manner in which the funds were obtained for making the New River. The common story, says Mr. Smiles, told of Myddelton's subsequent execution of the New River is that he was enabled to carry out the works by means of the large fortune he had realised by the working of a "silver mine in Wales." This has been repeated by every writer on the subject of Sir Hugh Myddelton's career, from Stowe downwards; but it is altogether without foundation, the only mining adventure on which he entered previous to the New River enterprise being that at Denbigh, which proved a total failure.

Before Sir Hugh Myddelton had commenced his great work of supplying London with water, a similar blessing had been conferred upon Plymouth by the construction of the "leet." Sir Francis Drake, who was born within ten miles of Plymouth, and settled in the neighbourhood of the town, after having realised a considerable fortune by his adventures on the Spanish Main, observing the great inconvenience from the want of water (clothes were sent more than a mile to be washed, and the water for domestic purposes was fetched from Plympton, five miles distance), as well as the difficulty of furnishing the ships frequenting the port with that indispensable necessary, conceived the project of supplying the deficiency by leading a store of water to the town from one of the numerous springs on Dartmoor. In 1587, when he represented Bossiney (Tintagel), in Cornwall, he obtained an Act enabling him to convey a stream from the River Mew, or Meavy, and in the preamble to the Act it was expressed that its object was not only to ensure a continual supply of water to the inhabitants, but to obviate the inconvenience hitherto sustained by seamen in watering their vessels. It appears that the town of Plymouth contributed 200*l.* towards the expenses of the works, Sir Francis being at the remainder of the cost. The leet was finished in four years, and the welcoming of the stream into the town was attended with great public rejoicing.

The mention of Dartmoor leads us to refer to Mr. Smiles's essay on Bridges, Harbours, and Ferries, for which he has a frontispiece very appropriate—the ancient British bridge on Dartmoor. In earlier times no considerable inconvenience was felt in having to cross streams by fording or swimming; afterwards an uprooted tree, or a couple fixed together, afforded ample accommodation, though inconvenience may have resulted from the entire structure being usually swept away with the heavy rains of autumn, and

hence, says Mr. Smiles arose the idea of tying the rocky gorges together by means of stone bridges of a more solid and permanent character. The first of such bridges in Britain were probably erected across the streams of Dartmoor. The rivers of that district are rapid and turbulent in winter, and come sweeping down from the hills with great fury. The deep gorges worn by them in the rocks amidst which they run prevented their being forded in the usual way, and the ordinary expedient of bridging the gaps in the track by means of felled trees thrown across was found impracticable in a district where no trees grew. But there was an abundance of granite blocks, which not only afforded the means of forming solid piers, but were also of sufficient size to be laid in a tabular form from one pier to another, so as to constitute a solid enough road for horsemen and foot passengers: hence the Egyptian-looking Cyclopean bridges of Dartmoor—a series of structures most probably coeval with the building of Stonehenge, and of the greatest possible interest. One of the largest of these bridges is that crossing the East Dart, near Post Bridge, on the road between Moreton and Tavistock, which is the bridge chosen by Mr. Smiles for his illustration. Though the structure is rude, it is yet of a most durable character, otherwise it could not have withstood the fury of the Dart for full twenty centuries, as it probably has done. The bridge is of three piers, each consisting of six layers of granite slabs above the foundation. One of the side piers, by accident or design, has unfortunately been displaced, and the tabular slabs originally placed upon it now lie on the bottom of the river. Each of the table stones is about 15 feet long and 6 feet wide, and the whole structure is held together merely by the weight of the blocks. There are other more perfect specimens on Dartmoor, but none of equal size. It is believed that no structures resembling these bridges have been found in any other part of Britain, or even in Brittany, so celebrated for its aboriginal remains. The only bridges at all approaching them in character are found in Ancient Egypt, to which, indeed, they bear a striking resemblance.

Old Bow Bridge, demolished some twenty years since, and the celebrated bridge at Burton-on-Trent, erected by Abbot Bernard, are carefully described; but we pass these interesting descriptions, to refer to Wade Bridge, with which many of our readers are familiar. "The erection of Wade Bridge," says Mr. Smiles, "over the River Camel, in Cornwall, is an example of the origin of many of these structures in early times. The benevolent Vear of Eglshayle, lamenting the number of lives that were annually lost in crossing the ferry, determined to raise a fund sufficient to build a bridge, and success crowned his efforts. It was erected in 1485, and claimed the distinction with Burton of being the longest in England. It consisted of seventeen arches, and was a highly picturesque object, though it has since been replaced by a more convenient structure." Returning to Wales, we find a beautiful engraving of Edwards's bridge, the Pont-y-Prydd, and we may commend the memoir of Edwards to general perusal. After the life of Edwards, we come that of James Brindley, the wheelwright's apprentice, who wrought such changes in commercial affairs on the western coasts of our island, by constructing canals under the patronage of the Duke of Bridgewater. The Duke's canal, when opened out to Liverpool, immediately conferred upon Manchester the immense advantage of direct connection with an excellent seaport; and other canals being connected with the Duke's system, the whole industry of the surrounding districts was brought, as it were, to the very doors of Manchester. But Liverpool was not less benefited by the Duke's enterprise. Previously, the woollens and cottons exported were sent by pack horses to Bristol by Bridgworth and the Severn, but the canals caused the concentration of the whole export trade at Liverpool. The additional accommodation required for the increased business of the port was promptly provided as occasion required. New harbours and docks were built, and before many years had passed Liverpool had shot far ahead of Bristol, and became the chief port on the west coast, if not in all England. Had Bristol been blessed with a Duke of Bridgewater, the result might have been altogether different; and the valleys of Wilts, the coal and iron fields of Wales, and the estuary of the Severn, might have been what South Lancashire and the Mersey are now.

In his second volume, Mr. Smiles gives us the lives of John Smeaton, John Rennie, and Thomas Telford; and the information obtainable from this portion of the work is certainly not less interesting than that we have already referred to. In connection with the life of Smeaton, we have the highly interesting history of the Eddystone, and the several futile attempts which preceded the lighthouse of Rudey, and the still more substantial structure of Smeaton. The narrative is admirably given; the reference to the joy-inspiring words "Eddystone light ahoy" reviving the thrill which can only be felt by those who know the pleasure of nearing the termination of a tedious voyage. With regard to Rennie, we have the history of his famous lighthouse on the Inchcape rock, for which Mr. Robert Stevenson, his assistant engineer, arrogated to himself by far too much credit; whilst in London Rennie has left a lasting monument of his own rearing—the beautiful iron structure, Southwark-bridge. The life of Telford is no less attractive, as it introduces us to some of the most elegant and substantial aqueducts in the kingdom. The Ellesmere Canal consists of a series of navigations proceeding from the River Dee, in the Vale of Llangollen. One branch passes northward by Chirk, Ellesmere, Whitchurch, Nantwich, and Chester, to Ellesmere Port, on the Mersey; another in a south-westerly direction, through the middle of Shropshire; and a third in a south-westerly direction, by Oswestry to the Montgomeryshire Canal, near Llanymynech, its whole extent, including the Chester Canal incorporated with it, being about 112 miles. On this canal Chirk aqueduct is a splendid piece of workmanship, yet almost sinks into nothingness when compared with that at Pont-Cysyllt, which Sir Walter Scott certainly justly described in speaking of it to Southey as "the most impressive work of art he had ever seen." The level of the water in the former is 65 ft. above the meadow, and 70 ft. above the level of the River Coriog beneath; the latter is 127 ft. above the lowest part of the valley it spans. We must leave our readers to refer to the volume for the remaining engineering works of Telford, and for the illustration of his very bold design of forming a bridge of a single span over the Thames, as well as for the descriptions of many of his lasting and beautiful works erected under his superintendence. The entire work is embellished with engravings of the best finish, the execution of which cost, it is said, nearly 1500*l.*; and as tinted plate-paper has been used throughout, the artistic skill is displayed to the best advantage; indeed, whether we consider the work for its contents, or the way in which it has been issued from the press, we can form but one opinion—that it is, as near as may be, perfect.

IMPROVED PROSPECTS OF ENGLISH INVESTMENTS ON THE CONTINENT.—The recent declaration by the Emperor of the French, that he will be content to maintain his army and navy on a peace footing, has induced investors to look with greater interest on the many opportunities which are constantly being presented from the Continent. Doubtless this increase of confidence in the solidity of political affairs will largely increase the flow of capital in that direction, and cause many dormant speculations to be revived—manufacturing as well as mining and railway construction. Thus we have seen the Paris Land Company well supported and floated by English capital, and also the coal mines in Prussian Germany. In connection with the new and improved prospects of investors in continental projects, our attention has been called to an extensive manufacturing project, which has been taken up by English capitalists, known as the Anglo-French Pottery Company, and of which we think a short account will be interesting to our readers. The porcelain manufactures are replete with interest, as involving the lowest form of art, in the production of "earthen vessels" of the meanest utility, to the most tasteful forms of ornament which art can devise and embellish; and there is an amount of capital employed in their production and sale which few have an adequate conception of. Suffice it to say that our pottery manufacturing districts are amongst those which rank high in the scale of our national industries. The following particulars of this undertaking we gather from the prospectus of the company:—It was projected and introduced to public notice immediately after cementing the alliance between England and France on the conclusion of the Russian war with the western powers. It was registered under the Limited Liability Companies Act, 1856-7. The nominal capital is 64,000*l.*, in 3200 shares of 20*l.* each; 2000 of these shares were taken by the proprietor of the manufactory purchased as an earnest of his faith in the goodness of the undertaking. He took no money payment whatever, and in consideration for these shares he transferred the whole property and good will of the business to the company. As a further proof of his confidence in the profitable character of the business, he allowed all the other shares, intended for the public, to bear a preferential dividend of 12 per cent. per annum out of the profits. The company has heretofore been composed of private gentlemen, who are mutually known to each other, and a few of their respective acquaintances, who had taken up only a portion of the shares authorized to be issued for the additional capital required to fairly keep pace with the great accession of business which the celebrity of the manufactory has attracted to it. The recent introduction of the new Commercial Treaty between this country and France justifies the expectation of a greatly increased accession of business to this establishment; and the directors, therefore, have resolved on offering the public an opportunity of taking a portion of the reserved shares, which bear 12 per cent. preferential dividend per annum. The London offices are at No. 35A, Moorgate-street, where specimens of its manufacture are on view. The business is carried on at the manufactory at St. Gaudens, under the joint control of the late proprietor and an English gentleman, who takes the management of the financial department of the establishment, in which both reside, for the purpose of keeping up a constant supervision of its business. They are responsible to the board of directors, whose office is in London. The property of the company comprises—"The very extensive porcelain manufactory known as the Valentine Manufactory, situated near the town of St. Gaudens, in the Department of the Haute

Garonne, in France, where the business of the company is carried on. The manufactory has been established thirty years, during which period its productions have obtained great celebrity, and twenty-two gold, silver, and bronze medals have been gained, amongst which are those awarded at the Exhibition in Hyde-park, in 1851, and the Paris Exhibition in 1855. The articles manufactured embrace white, painted, and printed earthenware; English china and porcelain wares, by both the lithographic and copier processes: yellow crockery, stoneware, bricks and fire-proof crucibles. The extent of the establishment is about 8 acres, all freehold. There are five monster ovens, four drying-rooms, twenty-four workshops, a dwelling house for the manager of large size, and very numerous offices, and appurtenances. The mechanism, with the most recent improvements, is such that a sack of clay, or a block of china, brought upon the premises in their natural state, are converted in a very short time into articles of the utmost decorative elegance—biscuit for statuettes and objects of *vernis*; stoneware, and imitation marble, architectural ornaments, &c." The manufactory is now in full activity, and very favourable results are being obtained by the improved system of working recently adopted by the managers. The company has recently received a considerable accession of share capital, through English investors, entirely subscribed by private parties, who have the greatest reliance on the success of the company, whose business has been long and securely established. The company's property has recently been surveyed by a deputation from the English shareholders, and a report of the French Government has pronounced the freehold worth 15,000*l.* in fee simple. The good prospects of the company are gratefully increased by the new free trade regulations between England and France; and, indeed, are such as to warrant the company's anticipations of greatly increased profits, especially as soon as its operations are extended, for which funds have been fully provided by the additional shares which have been taken up by the English capitalists just referred to. The Emperor's recent determination to reduce his expenses to that of a peace establishment has given greatly increased confidence to all capitalists who are desirous of reaping the high returns for capital which can be made by investing in any of the numerous manufacturing and mining industries of France, whose present great want is a plentiful supply of the great agent of trade—money, and who are now so plentiful with us, as to have but a very low percentage offered to its holders by our great trading and manufacturing establishments. In this calling attention to these English projects of employing capital in foreign countries for manufacturing purposes, we in no way wish to be understood as recommending them to our readers in preference to home undertakings, but as matters to be taken into consideration by those looking out for opportunities of securing large returns on their capital; and we shall, therefore, from time to time note all the more remarkable undertakings of this class which have been or may be introduced for the consideration of investors.

REMARKABLE MINERAL DEPOSIT.

At the Miners' Association of Cornwall and Devon meeting, the first paper was on a mineral deposit in Devon, and was read by its author, Mr. John Simmons, mineral agent of the Duchy of Cornwall. The paper was illustrated by a plan or section, showing that the deposits referred to were situated at one side of an old quarry, and by a number of very interesting specimens brought from the old workings. My principal object in furnishing this paper is with a view of cultivating among the members of the classes of this association a feeling for a mutual interchange of ideas and opinions on any subject that may tend to promote mining, and for the benefit of mining generally, observations particularly on mineral deposits, or mineral stains, in whatever locality they may be met with. Mining operations are carried on to such an extent at the present day in so many localities in both counties, and in various parts of the known world, as to afford every facility for practical observation to the enquiring mind; and if such facts and observations could be readily arranged, and brought before the public, they would be of great value and instructive to those who may not have the advantage of equal range for such observation and researches, and, no doubt, it would tend to the welfare of mining in all its branches. The few humble observations which I have to make are respecting a mineral deposit in a mine in Devon, called Wheal Hamblin. The mine is situated in the parish of Bristow, on the north side of the road leading from Tavistock to Okehampton, and is within about a mile north of the granite range of Dartmoor. The country principally is slaty, with patches of limestone, and a considerable quantity of black shale having the appearance of lignite, but is without any trace of organic remains, so far as I could perceive. The darkest of these layers (which he pointed out on the diagram) vary from 6 in. to 1 in. thickness; they consist of a soft decomposed matter, containing a large quantity of copper throughout, and by thrusting an iron substance into these seams it immediately becomes coated with metallic copper. The lighter coloured seams are harder, being of a slaty nature, and contain native copper and allophane, stained more or less with carbonate of copper in various places between the joints or heads. The whole mass is a peculiar formation of apparently numerous layers, tilted up to a ridge, plainly showing the existence of its anticlinal axis and disturbance, probably the result of some great acting force; and it was from the effect of copper stains exuding from the numerous seams that mining operations were commenced on it by a Cornish captain, who raised a quantity of the stuff, and on having a sample assayed from the whole bulk found it to produce about 24 per cent. of copper, but as this percentage was not enough to pay for working, together with the long carriage of ten miles, he commenced dressing and washing it with water, hoping that by lessening the bulk he might improve the quality, and from the great quantity which could be raised he was confident that he should realize a good profit, but by the application of water the copper was easily brought into solution, and evidently carried away with the water in process of dressing, as on sampling the prepared ore it was found to be entirely valueless—consequently the works were abandoned, to the very great disappointment of the sanguine captain. After lying idle for a considerable time, it was taken up by another party, who drove a level from the foot of the quarry, where the copper stains appeared the strongest. In driving this level, it was most remarkable that in cutting the dark copper-bearing layers a great rise in the temperature was perceptible, and carbonic acid gas was given off in such quantities as sometimes to extinguish a lighted candle. The men were obliged repeatedly to cease working until the gas had been liberated from the seam through the opening which had been made. This occurrence was frequently observed during the driving, until a shaft was put down, and ventilation effected, when the level was driven a few fathoms further in the hill, and a fine looking lode, 6 ft. wide, discovered, composed of iron pyrites and copper ore, but there not being sufficient copper in it when pierced through to pay for working, with its long carriage, without opening either way on this promising lode, the mine was again abandoned, and is still idle to this day. On visiting the mine on a recent journey to that locality, I was greatly struck, when entering the level, with its most remarkable appearance. Wherever it was dry sulphate of copper, associated with allophane (such as is present to you), was seen, their beautiful greenish blue and white colours greatly contrasting with the deep black matrix in which they are found. Native copper is also to be seen in the carbonaceous veins, of a peculiar granular texture, such as the specimens on the table before you. It is quite different from the crystals of native copper generally met with. On going further into the level it became damper, and a strong acid or chemical reaction was perceptible, and I at once came in contact with sulphuric acid, and the mine was almost to an end. The water is in many places there could be seen beautiful crystals in clusters stretching from one place to another. This substance appears to be an alum. The darkest colour of these specimens selected by myself on the spot contain a little iron and a small quantity of copper, but in the white and crystallized form there is not a trace of copper to be found. Now, it may be asked, what has produced the copper in the decomposed layers? Also, what is the cause of all this great change, and of these phenomena? In the first place, I believe the lode referred to is undergoing a great change and decay. The iron pyrites gradually decomposing, produces sulphuric acid, which, uniting with water, acts on the copper and brings it into solution, and by pressure it is driven through the decomposed layers, in which it is deposited. In the second place, it is possible that the sulphuric acid also, in passing through the slaty seams, gathers alumina, and probably this being dissolved by the high temperature of the water, produced by great heat generated by the gases or chemical action, and then coming in contact with the air, is deprived of its solvent power, and the alum deposited in the form seen; and probably the sulphate of copper, being also acted on in the same way, is gradually reduced and deposited as metallic copper in the peculiar granular form in which it is found. If we look at carbonate of lime, for instance, being held in solution by the presence of carbonic acid in water, which, on being subject to a change of temperature, or exposure to the atmosphere, and the escape of the gas, and thus the water is deprived of its solvent power. Water thus impregnated with carbonate of lime percolates slowly through the country until it reaches some excavations or open workings; and how often do we notice drops of water hanging to the backs of levels, and that some time elapses before the water is of sufficient size to fall. It is during this interval, and owing to the escape of carbonic acid, that a separation of some of the calcareous particles takes place; and it is thus from the particles which are separated and attached to each other successively that a stalactite is formed. But if the coating of the water be too rapid, so as not to allow sufficient time for it to be formed as a stalactite, it drops off and becomes deposited in the bottom; and this so formed would be called a stalagmite. Sometimes, when the water is pretty regular, a separation of the calcareous particles takes place, both above and below, until the substances so mechanically depositing increase, and in the course of time they unite, having the appearance of pillars; and, on visiting old workings which have been abandoned for a long period, how often do we meet with occurrences of this kind. Sometimes may be seen levels almost closed up in this way with substances such as oxides, sulphates, and carbonates, the result of chemical action holding both earthy and metallic minerals in solution, which on coming in contact with the atmosphere, or by change of temperature, becomes deprived of its solvent power. Hence my opinion, given on the subject brought before you; but whether or not, as regards the deposit, be received or objected to, such are the facts as I have stated to you. Perhaps some may contend that this peculiar formation, as well as all other mineral deposits, are produced by some great fire in the interior of the earth, and others may argue that it may be formed by gases, or water holding copper in solution, and percolating through the country; but whether or not it is the result of great heat from below, or from water containing copper in solution, and issuing through numerous fissures in the surrounding rock; or whether it is more probably the result of the decomposition of the lode referred to, or some great deposit of ore in the lode, and conveyed by filtration of water containing the copper in solution with other earthy salts, and the whole mass in course of time emerges from its first appearance, and then subject to the further change which is going on, it forms a subject for great thought and observation relative to the theory of mineral deposits and mining pursuits; and as far as curiosity goes in a chemical geological point of view, and of great probable worth, I know of no place in the two counties that can equal this most peculiar deposit at Wheal Hamblin. If the following remarks on this property are worthy of notice, they are at the public service. The set is extensive; it is situated a little to the north of the granite, and in the same channel of ground as the Great Wheal Friendship, which is situated to the south-west, and has, I believe, given upwards of 300,000*l.* of profits. Two large promising lodes have been discovered within its limits, bearing 10° north of east, and underlying 1 ft. 6 in. in a fathom. These lodes have not been seen at a greater depth than 7 fms. below the surface, but from a deep adit which has been driven nearly up to the quarry, they can in a short time be intersected 10 fms. deeper. There is an abundant supply of water, both for working any machinery that may be required and for dressing purposes. The great deposit which I have referred to can be broken at a little expense, and, being of a soft decomposed nature, it does not require crushing, and a small quantity of sulphuric acid will bring the copper into solution, and I believe it can be precipitated at a good profit. By carefully working the seams, from present appearances, a quantity of green and native copper of good percentage may also be saved; and, on the whole, looking at the great show of copper as emanating from some wonderful deposit in the lodes, the indications are such as tend to the existence of a good mine below; and I consider it as an investment for capital, with great probability of obtaining very profitable returns, and I know of nothing equal to it as such in the two counties. Mr. Enys, Mr. J. T. Pearce, Mr. R. Pearce, Capt. R. H. Williams, Mr. John Pearce, Mr. R. T. Grylls, Mr. Cady, and others, addressed the meeting on the subject of the paper read by Mr. Simmons, which was considered by all as one of the most important that could be presented to a meeting of miners.

FURNACES.—Mr. W. Benson, Hexham, has provisionally specified an invention which relates to an improved mode of supplying air to the burning fuel in furnaces, and consists of forming a number of horizontal air-vents along the two side

walls of the fire-chamber, and along the back or bridge thereof, such vents being slightly connected at the end next the fire, and expanded at the opposite end, which opens into an air-flue extending behind each series or set of vents, and communicating with the outside of the setting or brickwork. Dampers are supplied to these air-flues to regulate the supply. When a double furnace is used, the grate may be divided longitudinally by a hollow and perforated bridge, through which air passes freely into the fuel on either side thereof.

STEAM ON STEEP ROADS—IMPORTANT IMPROVEMENTS.

Stronger evidence of the importance in which steam traction is now viewed by the Legislature can scarcely be found than in the Locomotive Act, 1861, which, by repealing the prohibitory tolls that have for the last thirty years been in existence, has substituted a toll more equitable, and better suited to the advancement of science and the increasing requirements of the country; at the same time, giving to steam the opportunity of proving as important and needful to towns and villages lying out of the course of our railways as the railways themselves are to the principal cities of the kingdom. In situations where the amount of traffic or local obstruction do not justify the expense of a railroad, there will the steam traction engine be found the cheapest and most efficient means of transporting heavy merchandise at a moderate speed on roads already in existence. Few of the branch lines of railway in England are remunerative; they, instead of proving "feeders" to the trunk lines and increasing the profits, have proved "suckers" tending to diminish them; whereas by the adoption of steam traction on roads already constructed, the first cost of the railway would be done away with, and the expense could be regulated to the amount of traffic.

The railway system is limited and incomplete. No system can be called complete that does not furnish the means of carrying traffic into and out of every town, village, and hamlet within its reach. By steam traction this can all be done, and even more—heavy goods can be deposited at, and taken away from, the very doors of the parties forwarding or receiving the goods. A mine or landowner who lives twenty miles from a railway must pay at least 10*s.* per ton for all goods transported to and from the railway; and, consequently, he cannot compete on equal terms in the produce market with those more favourably situated; whereas by steam traction power he might have it conveyed for one-third of that sum.

Whatever disadvantages turnpike-roads may possess, they allow every species of carriage to travel upon them, and to draw off and on and across them at all places; that the farmer's cart or the wagon of the manufacturer can take their respective produce to market without the damage and loss arising from transhipment on the railway; and last, though not least, that a steam traction engine and carriages, by running on the ordinary roads, can collect merchandise or agricultural produce from all places where it is possible for a horse to draw it.

Now that the Legislature has abolished the prohibitory tolls, a regular system of steam traffic should be established on the common roads with the above object in view, and it would soon prove remunerative to those engaged in it, and would be favourably regarded by the public. It should be remembered that railroads are specially useful for speed, but steam on common roads can be applied to every purpose a horse can effect. A considerable number of horses must first be bought and then kept, whether working or idle, to do the same amount of work as one engine. The first outlay for the steam-engine will not much exceed that of horses, while the daily expenses, in proportion to the work done, is not one-half that of horses. The wear and tear of an engine, though expensive, would be but little, compared with the death and decay of horses to do the same amount of work, as the smallest engine likely to be used would, probably, do the work of twenty horses. Machinery only wears in particular places, which are capable of renewal; not so with horses, as when any part of them becomes unserviceable it is incapable of renewal, and renders the whole animal comparatively worthless, if not an actual loss to the extent of its keep.

Farey states that "steam-power is certain to be more profitable than horses if the work is to be kept constantly going on, because the great advantage of steam-power is, that it does not tire and becomes fully available; and to perform the same service by horse is a very great number must be kept for change. The result of working by steam is in lieu of horses is very great." The *Engineer* of July 6, 1860, after having enumerated several desiderata, says:—"The fourth desideratum is the general substitution of steam traction for horse-power on common roads for the haulage of merchandise. It has been satisfactorily proved that steam traction power can be provided at half the cost of horses, including all charges, and moving at the same speed. The so-called destruction of roads, frightening of horses, steam and smoke nuisances, are buggars; they can be prevented."

From the time of Cugnot, who made the first road-locomotive in 1769, until 1846 a great number of steam carriages for traction and passenger purposes have been tried with varying success, but their great difficulty in point of construction has been that they could not pass up steep hills, or on loose or newly-stoned roads; in fact, Mr. McAdam, in his evidence before the Select Committee of the House of Commons in 1859, states that "several engines were tried some years ago near Bristol, and that a newly-stoned road stopped them directly. There was one that went from Bath to Devizes in 1830 that was stopped by a coating of stones." Hancock, Gurney, and many others, including Mr. Scott Russell, have run steam carriages successfully, till they were crippled and disgusted with the tolls and the legislative enactments, which barred them from seeking to improve and bring into practical use this system of conveyance. In 1846, however, the greatest step was taken by the late Mr. Boydell, by introducing a system of endless railway carried by each wheel. The arrangements he introduced have since been improved in his patent of 1854, and by Mr. Chas. Burrell, of Telford, in 1855, and it is yet capable of still further improvement. Mr. McAdam, of Bath, who had travelled on an engine with Boydell's wheels, says, in a letter to the *Morning Post*, in February, 1860:—"Mr. Boydell's ingenuity having overcome the chief difficulty, I feel certain that the skill of our mechanical engineers will speedily remove all others; and with the assistance of the Legislature in the equitable adjustment of the almost prohibitory imposts that exist in some localities, I have every hope that road-locomotives and carriages, with the endless railways, will be extensively used as feeders to railways, and for the facility of the shipment of coal and minerals in every part of the kingdom, and that the public will be ultimately rewarded. The only advice I would venture to offer the public is not to adopt light or cheap engines; the inequalities of the ground, and the sudden shocks and strains to which these engines are subject, requires great strength and the perfection of workmanship."

A new description of Traction Engine, constructed on the principle that when working the weight of the engine and of the load in the carriages is transferable at will to the fore part of their respective wheels, has been invented and provisionally protected by Mr. John Marshall, C.E., a description of which, and of its power and the approximate cost of working, was given in the Supplement to the *Mining Journal* of Nov. 16. With this engine it is intended to place shoes, or the endless railway, under each wheel of both engine and carriages. It gives the maximum of tractive power to be obtained from a given diameter of cylinders and steam pressure, and Mr. Marshall maintains that it will prove most economical for haulage purposes. Each shoe forming the endless railway presents a bearing surface of 6 square feet to each driving-wheel, so that it would pass over not only bad roads without destroying them by slipping or sinking, but it would also cross with equal ease ploughed lands, bogs, or sandy deserts, and by the very principle of its construction ascend any hill, taking a load after it, calculated not for the rate of inclination, but for the horse-power exerted where it did not slide bodily backwards. In fact, any incline on which a balk of timber would not slide.

From the principle of the endless railway, as applied to traction engines, the heaviest of them cannot damage the road, but will rather compress and solidify it by a steady downward pressure. Mr. McAdam, Surveyor-General of Turnpike Roads, in his evidence before the Select Committee in 1859, says:—"I do not think if you were to travel with one of these engines over 100 miles you could say, speaking mathematically, that these shoes had not worn the road, but practically none." The result of a series of experiments, conducted at the instance of Government on engines constructed with Boydell's tires, and under the most severe conditions, gives the cost of haulage at a rate of 1*s.* 6*d.* per mile. In the principle of Marshall's engine, as regards the mode of applying the power to the wheels, the invention is as much superior to the present construction as Boydell's invention of the endless railway was to its predecessors in that respect. The Locomotive Act, 1861, forbidding the use of projections on the wheels, leaves only the selection between cylindrical smooth-soled wheels and shoes. Cylindrical wheels smooth-soled seem to have failed; there is, therefore, no choice left but to adopt the shoe, with which, and an engine built upon the principle of Mr. Marshall's invention, ordinary difficulties may be overcome to an extent that is now considered impossible. It is proposed to form a company (limited—see advertisement) to construct an engine and train of carriages on this principle, to be capable of ascending to the steep mountain mines of this country with a heavy load; and on its success being fully established to extend the capital and powers of the company to undertake the construction of engines and carriages on this principle, either to be sold or let for hire, or to carry at a price per ton per mile. The advantages of this system of traction is strongly urged upon the mine and quarry owners of the kingdom, to open up mines and quarries that are now almost worthless.

THE GOVERNMENT GUARANTEE ON INDIAN RAILWAYS.—A complete and satisfactory answer has been issued to the pamphlet "Indian Railway and Indus Flotilla Guarantees, Examined and found to be Delusive," by Mr. James Mill, to which we have referred upon a previous occasion. The new pamphlet emanates from Mr. W. P. Andrews, the Chairman of the Sindh Railway Company, and, although a compilation only, affords the most satisfactory conclusions. Instead of arguments put forward upon the authority of a "few days' consideration" of a heavy Blue Book, Mr. Andrews contents himself with simply collecting facts. First he gives the declaration of the *Times*, that the scope of the guarantees has never been disputed either by the Government or by the directors of the companies guaranteed; then his own letter, explaining the minutest details of the arrangement in the briefest terms; next the remarks of Mr. Crawford, M.P., at the East India Railway Company meeting, exposing Mr. James Mill's fallacy; then Mr. Hamilton's view of the matter; followed by an extract from the report of Mr. Julian Danvers (secretary, Railway Department, India Office), to the Secretary of State for India in Council, on Railways in India, to the year 1859, laid before Parliament. Mr. Mill's statements, and the action of the Committee of the Stock Exchange, is next given; and, lastly, the opinion of the "Money Market Review," which is acknowledged to be a high authority upon monetary affairs. After carefully weighing the arguments and facts brought forward by both parties, we can arrive at but one conclusion—that the Government guarantees upon Indian securities are ample, and not in the least liable to be disputed.

ECONOMIC RAILWAY.—As it is obviously unnecessary to waste iron in constructing railways, Mr. Lewis Gompertz's proposition for economising in this direction may not be uninteresting. He proposes an arrangement which would certainly be desirable in long and tedious journeys, as during half the time the passengers would be in a state of suspended animation. The carriages are to have five wheels on each side, and the rails are to be laid at given intervals. "The wheels," says the inventor, "cannot fall into the cavities between the rails, because they are so distanced as not to agree with the distance of the rails."

WATER LOCOMOTION.—As an improvement upon the present system of shipbuilding and locomotion in water, Mr. Lewis Gompertz, of the Oval, Kennington, proposes flat-bottomed vessels with perpendicular sides; the stem forms a very acute isosceles triangle; the stern is curved inwards; when sails are used the masts are very short, carrying flat square-sails, and when cars are used the rowlocks are placed on the opposite side of the boat to that on which we are accustomed to use them; each car crosses the boat, and being provided with a balance-bob, these arrangements reduce the labour, and admit of the rowers sitting with their faces forward.

LOCOMOTION ON COMMON ROADS.—An improved description of wheel for escaping the obstacles of the road, and for saving the wearing of the road itself, has been proposed by Mr. Lewis Gompertz, of the Oval, Kennington. The novelty consists in the use of square wheels instead of round ones, which is regarded as a vast improvement. The angles are jointed, and from the centre of each face there is a connecting rod to the opposite face, and the centre of these jointed cross-bars is made the axis of the

wheel. In motion the wheel "is changeable from a square to a rhomboid . . . and in order for this machine to act as a wheel, each end of the joints have a small wheel behind them, which press upward on a sort of conoidal curve, which guides the motion, so as to enable the carriage to travel in a right line, parallel with the road." The conoidal curve and wheels, says the inventor, "must be true to a hair;" and he goes on to explain how truth in this respect is to be arrived at. He also describes several modifications of the idea.

PROSPER UNITED MINES.

It must be satisfactory to the promoters of the company for working these mines to see the favourable progress made since the commencement of operations, and considering that it is not yet eighteen months since the company was formed, and less still since the first earth was broken at surface. There are, no doubt, a few whom the general, severe, and long depression in mining, as well as in other departments of business, has made to feel the inconvenience of the necessary calls that have been made; but it was stated from the first that a large amount would be wanted for machinery, &c., and all that amount has not yet been called up. At the meeting in July this estimate was increased to 25,000l. (of which 18,000l. is called), mainly on the ground that new, instead of second-hand, machinery had been erected, and that the pumping-engines are more powerful than were at first intended. For mines like these it is very important that the machinery should be new and powerful, as breakages are expensive casualties, and it is far better to have too much than too little power. Now, we could name a number of mines which are dealt in in the market, and which have been constantly and strongly supported and recommended, which have been dragging on for a number of years, and upon which have been expended sums respectively much larger than is ever likely to be required for Prosper United; their position and prospects bearing no comparison with the latter, which is likely to sell more ore in the first twelve months after it is in proper working order than many of the mines alluded to have done since their commencement. Indeed, from what we have learnt in several quarters, we believe that jealousy and personal feeling have chiefly actuated certain attempts that have been made to prejudice the undertaking by parties whose self-interest would be to mind their own business, who, no doubt, are aware of this, from the particular course they have adopted to effect their object. It is really a pity that so much of this personal animosity should exist among mining men; it being too generally the practice to condemn indiscriminately everything but that which they are connected with.

We will now briefly draw attention to the representations made in the original prospectus. The mines are those known as Wheal Prosper, West Prosper, East Rodney, and Trevarthian Downs, forming a run of about 1000 fms. on the course of the lodes, by about 700 fms. wide. Large returns and profits (sometimes exceeding 3000l. for two months) were made from Wheal Prosper, even under adverse circumstances, and after the affairs of the then company got into Chancery. For the last six years that the mine was at work the standard averaged only 108l., and at the time of the stoppage (at the French revolution in 1848) it was only 90l., while the price of tin was only 35l. to 40l. per ton. The mine returned as much as 400 to 500 tons of copper ore, and 10 to 20 tons of tin, per month; and the same quantities would now realise considerably larger sums than they did then, the standard averaging now about 130l., and the price of tin ore being about 75l. per ton. The means of dressing the tin were then very limited (having then only a few water-stamps), and the price obtained was only about 36l. per ton. Steam-stamps are now being erected, which will enable larger quantities to be returned, and which will realise about double the price per ton they did when the mine was at work last. Wheal Prosper and West Prosper were then worked by two distinct companies; the latter with inadequate machinery, and the former could not drive further in that direction without assisting to drain West Prosper. These causes were serious obstacles to the development of the mines, which cannot now exist. Being united under one company, they are considered to be one of the very best and safest speculations of any kind, and that they will in a short time yield large profits. Capt. T. Richards, who was the former (and is again) manager, stated in his report that as soon as the water is drained, and the mine in working order, 200 to 300 tons of copper ore, and 8 to 10 tons of tin, will be returned monthly, and this will probably be much increased as the ground is opened. In the last month the mine was at work 290 tons of copper ore were returned.

The quality of the ore is good. Capt. Wm. Martin (late managing agent of Trevarthian Mine, and who frequently inspected Wheal Prosper when it was at work) says:—"I am fully persuaded, by my own calculations, that from 300 to 400 tons of copper ore per month, the first twelve months after the mines are brought into effectual course of working, can be obtained, besides 10 to 12 tons of tin ore per month. This quantity is not excessive, taking into consideration the great extent and size of the lodes, and their prosperous appearances. Hosking's and Moor lodes are from 6 to 12 ft. wide, and these of themselves will doubtless yield immense quantities of ore." "The great unexplored mass of high ground between the two mines, 180 fms. long, on all the lodes, and passing through the elvan course, presents such unexceptionable chances of success that it removes every doubt from my mind of its being a very prosperous undertaking, and, if judiciously managed, will yield immense profits. In the course of my mining career I have discovered several good mines, and realised greater profits than any other person has done in this county, but in none of them did I find better prospects than can be found in Prosper United Mines." He considers it can be made a "first-rate paying mine."

Capt. Johns (who was one of the underground agents) states that the 30 ft. level west of Wheal Prosper was the deepest driven in that direction, and that a large quantity of tin and copper was raised from it, the end being left off rich, "which he remarks" may appear strange, but that at that time there was no idea of the mine being stopped; but the driving of this level was suspended in consequence of the two elvan courses which traverse this set crossing each other near the boundary, and which extend through West Prosper set adjoining, and from which mine the water would be drained by intersecting them. West Prosper was sunk to the 40 ft. level from surface, but the engine not being of sufficient power to keep the water, the adventurers could not prosecute the mine to advantage. I have not the least doubt that both east and west of the intersection of the elvans there are large deposits of tin and copper ore; in fact, as far as the lodes have been driven on in both the mines this has been proved; and there is still a piece of unworked ground between the workings of the two for 150 fms. in length, which will doubtless turn out an immense quantity of mineral. Now that both mines are granted to the same party it will make a great, lasting, and very profitable concern. I do not know of such another extent of ground as this set now consists of, containing so many large and highly mineralised lodes, and which are so favourably situated with regard to elvans and cross-courses. Our last sampling of copper ore was 290 tons for the month; the quality of the ore is very good. Had West Prosper Mine belonged to Wheal Prosper adventurers, there is no doubt but the run of mines would be working at the present time, and for years hence. The shafts are all firm and solid, and the levels are all in good working order, which is a great consideration. It may be stated that the dikes are at the low rate of 1s. to 1s. 4d.

Since the operations were begun, in July, 1860, two new 70-in. pumping-engines have been erected and set to work; and two others for crushing and hauling have been erected, one of which is at work, and the other nearly so, while the stamping-engine is being erected. The shaft at West Prosper (called Louise's) has been drained to the bottom (the 40 ft. level); and Hosking's shaft, at Wheal Prosper, is the same to the 30, and will soon be to the 40, while the 60 is the deepest level. Both these shafts have been enlarged and made good to the 30. As soon as the water was out of the shallow levels a number of quite pitches were made, and the shafts at least fifteen feet now being worked, and they are daily increasing, there being a large quantity of ore round left which will pay. They have only lately begun to drive the 30, west of footway shaft, and already they have got a fine lode, 4½ ft. wide, composed of superior gossan, black, grey, yellow, and carbonate of copper, yielding 8 tons per fathom, and likely to improve. The winze sinking below the 30, on the tin lode, has been holed to the 40, and the end is being driven, worth 40l. per fathom, which is likely to continue a long distance, judging from the character of the lode. There is also a good lode for tin in the 30 end, west of Caroline's shaft. On the whole, the mine is opening, we may even say, better than was anticipated, and the state yet arrived at in an operation of the kind, and of the months the returns will likely show that these mines are destined to hold a position for productiveness and profits scarcely, if at all, inferior to any in Cornwall. The course of ore in the 30 west is exceedingly good, and has every appearance of lasting. If it continues, of which little doubt is entertained, it is said that it is the best discovery made in Cornwall for a very long time. It has made similar to Wheal Fortune, which is parallel in the opposite hill, and which produced an immense value in copper about the elvans, the same as this lode is now situated. The tin part continues to look remarkably well. All this is much better than could have been expected, from the very little that could be done underground yet.

MINING IN CUMBERLAND.—The ancient copper and lead mines of Cumberland, in the neighbourhood of Keswick, have, as is evident from the close rolls of the reign of Henry III., been known for more than six centuries. Edward IV. granted a charter for working these mines; and in the beginning of the reign of Elizabeth a copper-works was erected, the most famous at that time in England. The Rev. Thomas Robinson, of Ousby, whose "History of Westmoreland and Cumberland" was published upwards of a century and a half ago, and is now very scarce, referring to the copper mines in question, says:—"The operations, managers, and miners were most of the Germans. The chief steward of the work was one Heckerster, who, by his book of accounts, which are most regular and exact, and all on imperial paper, as well as by other writings I found under his hand, appears to have been a man of great learning, as well as judgment in minerals and metals. The copper ore which kept these large furnaces at constant work was, for the most part, got in the veins upon Newland Mountains. Some small quantities of ore were also got upon Calbeck and Cunningham Mountains, and brought to the great work at Keswick, being a place most convenient both for water and coal, which they had from Bolton Colliery. In our survey of the mountains of Newland we found eleven veins opened and wrought by the Germans, all distinguished by such names given them as Gold-Scalp, Long Work, St. Thomas Work, &c., of all which veins the richest was that called Gold-Scalp. We found the vein wrought 3 yards wide, and 20 fms. deep above the grand level, which is driven in a hard rock 100 fms., and only with pick-axe, hammers, and wedges, the use of blasting with gunpowder being not then discovered. For securing of this rich vein no cost of the best oak wood was spared; and for the recovering of the soles under level was placed a water-gin, and water was brought to it in troughs of wood upon the tops and sides of high mountains, near half a mile from the vein, the one at the top of the vein, which appeared by daylight, was sulphurous, but in sinking deeper the vein got more moisture, and the ore improved in goodness. The ore got by gin under level was so rich in silver that Queen Elizabeth sued for it and recovered it from Earl Percy (lord of the manor) for a royal vein. Most of the most judicious chemists of England were concerned in the trial, either as of the jury or evidence. The verdict was given for the queen; and, as the German books give account, a hundred tons of ore was entered upon by the queen's agents." The sovereign, by her prerogative of coining, was entitled to all mines of gold and silver, though these metals were found in mines of base metal, and hence the queen recovered against Earl Percy. The Alston Moor mines are also very ancient; they may be traced to the latter end of the reign of Henry I. From the Cumberland pipe rolls of the reigns of Henry II. and Richard I., it appears that the total rents and profits of the mines in Northumberland and Cumberland during these reigns amounted to 4586l. There was a mint at Carlisle in the twelfth century, which was probably supplied with silver from Alston. The miners of past centuries have left their traces behind them in the workings, which may be distinguished to the present day. Iron ore is now being sought for in parts of the county where it was scarcely ever before thought to exist. What with railways and the enterprise of capitalists, says the *Carlisle Journal*, it is impossible to say what a few more years may develop of the mineral wealth of Cumberland.

ARTIFICIAL STONE, AND PRESERVATION OF TIMBER.—Mr. F. Ransome, Ipswich, proposes to form artificial stone by mixing broken, or powdered, chalk with the silicates of soda or other alkali, and he moulds the compound in blocks, which, when dry, he washes over with a solution of a chloride, to convert the soluble into an insoluble silicate. In treating wood he forces a solution of silicate of soda, or other alkali, through the pores, and afterwards applies a solution of a chloride in the same manner.

PLAN OF THE SETON DISTRICT.

MAP SHOWING THE RELATIVE POSITION OF THE SETON MINES, AND OTHERS ADJOINING.



THE MINING DISTRICT IN WHICH EAST WHEAL SETON IS SITUATED.

In the great mining district in which the Setons are situated there are three parallel ranges of mines, one at the north foot of the granite hills, which form a part of the great chain traversing the entire length of Cornwall, in an east and west direction, and forming, as it were, its backbone. This includes Dolcoath, Stray Park, Camborne Vean, Cook's Kitchen, Tincroft, and Carn Brea. The next, north, includes the north part of Tincroft, South Crofty, and the Old South Roskear Mine; and the most northerly range comprehends East Pool, North Pool, North Crofty, North Roskear, Wheal Seton, West Wheal Seton, New Wheal Seton, and East Wheal Seton. The earliest of these mines worked and found rich in copper and tin were those at the foot of the granite hills, and then those lying next to them. It was thought, however, by the miners of those days that the ground still further north was beyond the circle in which metals would be found in sufficient abundance to be remunerative, and, therefore, that it would be only wasting capital to give it a trial. A great change has, however, since come over the mind of the mining world in this respect, and it has since been found that conditions which were formerly disregarded have a very important effect in rendering lodes highly productive of metals. One of the most important, and now most generally recognised, of these is the existence of the elvan rock in proximity to a lode, and traversing the stratum in which it is embedded in a nearly parallel line, so as to form a junction with it at varying depths. This has been found a position equally favourable, with immediate proximity to the line of junction of the granite and killas rocks.

The first experiment tried in this extreme northern range was North Roskear, which, like many young mines in untried localities, had at first to struggle for existence against prejudice and adverse circumstances. During its fluctuating fortunes agents from the then most celebrated mining districts were called in to pass their opinions on the probability or otherwise of success being met with, and one of the most renowned of these authorities gave a very sweeping condemnation of the concern. In spite of this, however, and in accordance with the advice of the then underground agent, and since manager, the development of the mine was persevered with, and after an outlay on the part of the shareholders of about 7000l. discoveries were made, which gave a profit of about 110,000l. When this mine was commenced, Dolcoath, and others in the same range, were worked to a considerable depth, and were then considered to be getting old; but so rapidly were the operations conducted in North Roskear, that the principal engine-shaft has been sunk from the surface to a depth of 267 fms. This operation has, however, been abandoned for nearly 10 years, the deepest levels having been found unproductive. This work has all been done in a very hard rock, all of which required blasting, and a great part of which was greenstone, or as the working miner terms it, ironstone, which is the hardest description of rock the Cornish miner has to contend with. Since the commencement of this mine about 1900 fms. of shafts have been sunk, and over 20 miles of levels driven, in addition to plans cut, and a large area of the lode taken away as ore ground. From these facts some idea may be entertained of the quantity of copper and tin ore which must have been extracted to defray the cost of operations so extensive; and the immense sum of money realised from which has, after giving a profit of over 100,000l. to the shareholders, been distributed to the labourers, shopkeepers, and merchants. The benefits which have thus been conferred on all classes of the community owe their origin to the decided opinion which Capt. Joseph Vivian expressed, that success would certainly be met with, and which he did at a time when the mine had been condemned by a then eminent authority, and in the face of adverse circumstances, which induced the shareholders seriously to think of abandoning the concern. The operations have been under his control from the commencement, and the energy and skill displayed in the development of the property were soon attended with the success which fully justified the confidence he expressed in the result to be obtained.

The prosperity met with in North Roskear led to the working of East Wheal Crofty (now called North Wheal Crofty), which adjoins it on the east, and equally good results soon followed, large courses of copper ore having been discovered very near the surface, and near the junction of the lode and elvan course, from which over 90,000l. were divided amongst the fortunate shareholders. This mine was under the management of the late Capt. Nicholas Tredinnick. It is now being worked under the management of Capt. Joseph Vivian, the principal resources being tin, at levels below where the lode ceased to produce copper, and such good discoveries have been lately made in this department that profits are now being made, and dividends may be looked forward to with confidence.

East Wheal Crofty induced the working of East Pool, where, on an outlay of 3104l., dividends to the amount of 39,040l. have been declared, and the mine is still making large returns of copper and tin, from which further profits are likely to be derived.

North Pool followed as a consequence of East Pool, and the profits realised were 61,450l., on an outlay of 8180l.

The ground now occupied by the Setons remained unnoticed until the great discoveries which were made in North Roskear directed attention to it. One of the richest lodes in the last-named mine was found, after forming immense courses of copper ore both in North Roskear and East Wheal Crofty, to pass in going west into the ground now called Wheal Seton, the value of which was thus pointed out. A sett of it was obtained by Mr. Tilly, the solicitor and steward of Mr. Seton, and great credit is due to him, as the pursuer of the mine, for the indomitable perseverance with which the explorations were conducted, and for the great success with which they were rewarded. The dividends declared by this mine amount to 52,173l., and large quantities of copper and tin continue to be returned. Fresh discoveries having been recently made, the shares now command a market value for the whole concern of about 45,000l.

West Seton was next started, and although at first presenting but little indication of riches, the lode being near the surface of a very unfavourable character, has since turned out the richest of the group. It has already divided 128,800l., and continues to make regular and large dividends, commanding a market value at present of 118,000l. The next mines to notice as forming a very important part of the same district, and prominent members of the Seton group, are New Wheal Seton and East Wheal Seton. The former of these is immediately west of and adjoining West Wheal Seton, and the latter immediately east of and adjoining Wheal Seton. New Wheal Seton will probably be found rich, and profitable at deeper

levels than have yet been reached, the ore being found deeper as the lodes go west, corresponding with the dip of the junction of the lode with the elvan, as was pointed out in last week's Journal. The operations are being vigorously developed in depth, and the property already has a market value of about 18,000l.

East Wheal Seton possesses all the advantages and most favourable features of the most productive of the mines which have been referred to, and it seems destined to occupy the same position in the future history of the rich district in which it is situated as those which have already given so much wealth have done in the past. It will be seen that the extension of the mining field under consideration has been gradual, one mine following naturally as the result of another. All the features of East Seton are of a favourable character: its position, the lodes by which it is traversed, and the additional advantage, which the other Setons do not possess, of the lode coming into contact with the elvan very close to the surface, thus affording the best possible chance of great discoveries of copper being made by a small outlay, and without the tedious lapse of time which so often tires out those who enter on mining enterprise.

WEST CARZIE MINE, IN THE PARISH OF ST. ERIC, CORNWALL.

In 1000 shares, at £5 per share. On the "COST-BOOK PRINCIPLE."
PURSER—Mr. James Hollow, Lelant, Hayle.
MANAGER—Capt. William Bishop, Hayle.
ENGINEERS—Messrs. George Eustice and Son, Hayle.
BANKERS—Messrs. Bolitho, Sons, and Co., Penzance.
Committee of management to be elected at the first general meeting.
£1 10s. to be paid on allotment, and £1 10s. within three months after.
A discount of 5 per cent. will be allowed on the second instalment if paid with the first.

This mine is situated in the parish of St. Eric, and comprises the eastern or undeveloped part of the Wheal Lewis sett, and is held under grants from His Grace the Duke of Leeds, W. B. Tynningham, Esq., and others, at a very liberal dish of not more than 1-20th. The extent of the sett is very great, being about one mile in length and 700 fathoms in width. The lodes in it are most numerous, and nearly all of them worked upon in other mines, have been very productive, and largely profitable.

In the western part of the present sett about £300,000 worth of mineral has been sold, and about 500 fms. on the lodes are still unexplored below adit. The division between the new and the western or old working is complete, and effected by a clay cross-course, which has never been cut through below the adit.

A great deal of work has been done which is of great importance to the present adventurers. The adit has been cleared and secured at great expense upwards of 300 fms. in extent, and tin in great quantities raised and sold therefrom. The principal part of the proposed operations is where the adit passed through a good run of tin ground for about 30 fathoms in length, and from which about £1200 worth of tin has recently been sold, and at present good returns are being made; very lately £4½ worth of tin was broken from 2 fms. of ground in this adit. A shaft has been sunk about 10 fms. from surface, and a rise against it in the back of the adit about 7 fms. high in this tin ground, leaving about 10 fms. only to effect a communication. The object is to effect this, and to make this an engine-shaft; sink it in the tin ground, and drive east and west, when there is not the least doubt that profits will be made.

It will be seen that the object of the company is not so much to seek for tin ground as to develop that already discovered, and the mine is, therefore, to a great extent lessened of its speculative character, and becomes more of a certainty. Returns of tin now being made will be kept up, and increased by extending the workings. The side lodes can be worked on at very small cost by driving on the cross-courses, and if they also prove rich the property will become very valuable. It is worthy of note that the West Providence Mine adjoining this on the north, and Wheal Tremayne on the east, when so rich, began to make their first profits at about the depth of this mine.

In addition to all the work done in clearing out adits, shafts, roads made, &c., there is a great deal of property now on and in the mine, comprising an excellent 33-in. cylinder engine, water stamps, account-house, manager's residence, dry, smith's shop, &c. besides a great deal of land already paid for as used; the whole worth a very large sum of money to the adventurers. After paying for all these out of the sum subscribed, there will remain a clear sum of £1000 in the bankers' hands, which will be ample for twelve months to come; further calls after that will be regulated by the requirements of the mine, which it is expected will be very little, if any, as the sales of tin, it is hoped, will thereafter yield a profit.

Reports, &c., from F. Pryor, Esq., of Redruth; Captain Roberts, of West Basset, and other mines; Captain Daw, of Carn Brea and other mines; and Capt. Bryant, of Hayle, will be found most satisfactory, and may be had, together with forms of application for shares, of the purser; Mr. PROSSER, 1, Crown-court, Old Broad-street; and Mr. Wm. LEELEA, 11, Royal Exchange, London.

THE HAFOD LEAD MINING COMPANY (LIMITED)

Capital £50,000, in 10,000 shares of £5 each, the first issue being limited to 6000 shares.

Deposit, 5s. per share, to be paid on application, and 15s. on allotment.
No call to be made at intervals of less than three months.
Incorporated under the Joint-Stock Companies Limited Liability Acts, 1856 and 1857, so that shareholders will be liable only to the amount of their individual subscription.

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This company is formed for the purpose of raising the rich silver-lead ore on the Hafod estate, Cardiganshire, on the north of the River Ystwy, 12 miles from the seaport of Aberystwyth.

The grant is about 2050 acres, and it is immediately surrounded by the richest and most lasting mines in the Principality. On the west are the well-known Grogwinton, Fronch, Llangyfan, and other lodes of the Lisburne Mines; on the east, the celebrated Cwmystwith series of lodes, the Bodolli Mines, and numerous others, the great value of all of which has been known for many years.

The shares of the Cwmystwith Mines, with £60 paid, have paid in dividends £231 10s. per share; and the Lisburne, with £18 15s. paid, £377 10s. per share.

The term of the lease is 40 years, from January 1, 1861, at 1-20th royalty, free from any dead rent—terms of unusual liberality compared with the surrounding mines, the generality of which are leased for 21 years only, at 1-10th royalty.

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Prospectuses may be had on application by post or otherwise, and specimens of the ore and reports seen at the offices of the company, No. 9A, Great St. Helen's, E.C.
N.B.—A large amount of the capital having been already subscribed, operations have been commenced at the mines.

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"The Mechanics' Magazine" has from its establishment had an extensive circulation, and it communicates, for 4d. per week, far more valuable information, both scientific and practical, than was ever before placed within the reach of even those who could afford to pay six times as much for it. —Lond. Brotham.

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A Monthly Trade Circular. Entered at Stationers' Hall, and registered for transmission abroad. Office, 24, Bow-lane, London, E.C.

The Ironmonger is published on the last day of every month, and supplied to the trade only for the sum of 5s. per annum, post free. It contains Leading Articles, Minor of the month, List of Contracts open, Extracts, Trade Reports, Price Currents and Statistics, Reports of Trade Meetings, &c., List of English and Foreign Patents, and Novelties (illustrated when necessary), Correspondence, Gazette, and other matters interesting to the trade, specially selected and arranged for its columns.

Manufacturers and wholesale houses will find this journal the best possible medium for bringing their articles before the trade, no expense being spared in its introduction at home and abroad, wherever the English language is spoken, and a permanent English and Foreign circulation of several thousands per month being guaranteed. Scale of charges for advertisements:—Page, 5s.; half page, 2s.; quarter page, 12s. 6d.; per word, 10d. Assistants' advertisements, not exceeding 24 words, will be inserted for 1s. each.

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Spain is determined to share the advantages resulting from an extended commercial intercourse with England. The Vintage Wine Company import Spanish wines at such prices as to induce customers to give the preference to sherry instead of to the light wines of France. —Court Circular.

Not only excellent in quality and flavour, but remarkable for cheapness—18s. per dozen for a genuine mild sherry for the dinner table. —Sun.
A pure, sound, and palatable wine, and far more fitted for our climate than the thin acid clarets of France. —Press.

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X E R E S C O M I D A S H E R R Y,
Soft, fine body, age and flavour, and genuine.
Eighteen Shillings per dozen. False Twenty Shillings per dozen.
Quite equal to that which we have accustomed to give 60s.—Atlas.

Extraordinary for the money, and that no man need be ashamed to put on his table. —Mark Lane Express.
TERMS:—Cash only. Country orders must contain remittances. Town orders to be paid for on delivery.
CARRIAGE.—Orders of two dozen and upwards carriage paid to any railway station in England.

SAMPLES.—Samples of the wines forwarded on receipt of eighteen postage stamps. Bottles, &c., charged at cost price, but not returnable.
MODE OF REMITTANCE.—By Post-office order, payable at the General Post-office, London; or by cheque, crossed to the Bank of London.

N.B.—In either case the order or cheque to be made payable to the Vintage Wine Company. Vintage Wine Company. Importers of Spanish wines.
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This company is PREPARED TO GRANT LICENSES on moderate terms for the USE of their PATENT for STEELING RAILS, POINTS, CROSSINGS, MACHINERY, and EVERY DESCRIPTION OF IRONWORK.

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APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. BASTIER begs to call the attention of proprietors of mines, engineers, architects, farmers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shaft, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine, as daily demonstrated by use:—

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3.—It occupies a very small space.

4.—It raises water from any depth with the same facility and economy.

5.—It raises with the water, and without the slightest injury to the apparatus sand, mud, wood, stone, and every object of a smaller diameter than its tube.

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A mining pump can be seen daily at work, at Wheel Concord Mine, South Sydneyham, Devon, near Tavistock; and a shipping pump at Woodside Graving Dock Company (Limited), Birkenhead, near Liverpool.

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London, Oct. 10, 1859. Hours from Ten till Four. J. U. BASTIER, C.E.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

BUTLIN'S APPARATUS FOR SUPERHEATING STEAM.

by which means a SAVING OF THIRTY PER CENT. IN THE CONSUMPTION OF FUEL IS EFFECTED, TWENTY-FIVE PER CENT. LESS WATER IS REQUIRED TO FEED BOILERS, a GREAT INCREASE OF POWER IS OBTAINED, and the BOILER IS RENDERED MORE DURABLE. The above patent can be applied to any boiler, either new or old, and to every description of engine. Most extraordinary reports have been received from parties who have used it, equally satisfactory to the following letters, and any further particulars may be obtained by applying to the patentee.

W. BUTLIN, VULCAN WORKS, WESTON STREET, NORTHAMPTON.

TESTIMONIALS.

Leadon-street, London, E.C., July 3, 1860.
DEAR SIR,—Having applied your patent steam superheater to the boiler of our steamship, City of Nantes, we have great pleasure in being able to state that your apparatus effects a saving of at least 30 per cent. in the consumption of fuel, besides giving additional speed upon the screw. We do not hesitate in giving our opinion that your invention is a most important one, and one which must come into general use. We approve of your arrangements for admitting saturated steam with the superheated, to regulate the temperature at pleasure. Your plan of filling the heater with water during the time steam is being got up we think is quite a new idea, and remedies one of the great objections to superheaters generally—the rapid destruction of the tubes by the fire while steam is getting up. You are at liberty to make what use you please of this letter, as we think so valuable an invention ought to be made known to the steam shipping interest of this country. We are, dear Sir, your truly,
W. BUTLIN, Esq., Northampton.

Little Houghton, Northampton, July 29, 1861.
DEAR SIR,—We have given our engine a sufficient test, both in thrashing and sawing, since the introduction into it of your superheater, to enable us to speak confidently of the great improvement made by the alteration. We believe that your advertisements do not exaggerate the excellence, in any respect, of your patent. Many respectable parties who witnessed the working of the engine are willing to bear testimony to the truth of our statements. We remain, dear Sir, yours very truly,
SMITH AND THURSTON.

Naseby, Northampton, Aug. 24, 1861.
SIR,—I have much pleasure in being able to state that since your patent steam superheater has been applied to my engine I find a considerable reduction in the consumption of fuel, much less water is required to feed it, and a great increase of power is obtained. I am much pleased with the alteration. Yours truly,
L. WILFORD.

SIR,—I am well satisfied with the alteration made in my engine, as it takes less coal and water since your heater has been introduced into it. Yours truly,
CHRISTOPHER COLEMAN.

Earl's Barton.

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MANUFACTURERS OF PATENT TUBULAR TUYERES.

Having been very successful in MANUFACTURING and REPAIRING the PATENT TUBULAR TUYERES, and securing our patent for a further term of years, we have great pleasure in offering them to the public, at a considerable REDUCTION IN PRICE.

Our manner of repairing will make them as LARGE and GOOD AS WHEN NEW (which is not the case with the ordinary tuyere) for half the first cost, when there is not more than 12 inches of the nozzle destroyed; and the nozzle returning them carriage paid, and are confident they will be the cheapest and best ever offered to the mining world.

The PATENT TUBULAR TUYERES having maintained a most honourable reputation since their introduction, and been thoroughly proved to answer all the purposes set forth by the proprietors (when properly treated), it is, therefore, deemed unnecessary to publish a list of the patrons, or enumerate cases of their success. Although by such a procedure very much might be said in their favour, yet the readers would never be so fully convinced of their sterling worth as by a practical trial.

The future scale of prices will be as follows, including sockets:—

No. 1 Tuyere, 16 in. long	28s. each.
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R. H. HUGHES.

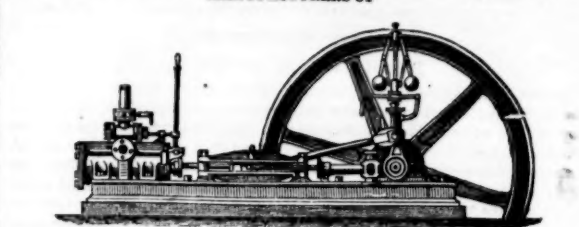
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The directors of a Provincial Insurance Company having recently amalgamated with a London office, have no further use for a number of wrought-iron fire-proof safes and deed chests, now lying at their chief and branch offices. They were all made to order in November, 1860; are WARRANTED FIRE and BURGLAR-PROOF, and through quite equal to new, will be sold for about HALF THEIR COST. The manager will send on application a description of the various sizes, internal fittings, cost, and present price of each safe; and to remove the obvious doubt felt in buying an article unseen, it is requested that intending purchasers will, in no instance, remit the money until the safe is received. They will be sent carriage paid, and if not found in all respects perfect, may be returned. Address, the Manager, Insurance Office, 47, Bath-row, Birmingham.

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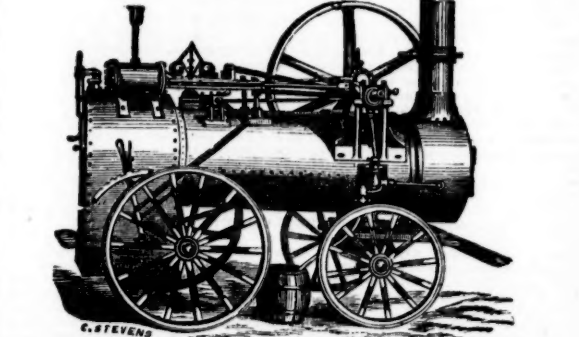


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The crucibles manufactured by the PATENT PLUMBAGO CRUCIBLE COMPANY have been in successful use for many years by some of the largest ENGINEERS, BRASSFOUNDERS, and REFINERS in this country and abroad. The great SUPERIORITY of these melting pots consists in their capability of melting on the average 35 to 40 pourings of the most difficult metals, and a still greater number of the ordinary character, some of them having actually been worked for the EXTRAORDINARY number of 96 heats. They are unaffected by change of temperature, never crack, and become heated much more rapidly than any other kind, thereby SAVING more than FIFTY PER CENT. in fuel, time, and labour. Lasting as they do for such a length of time, the saving of waste is also very considerable.

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The Patent Plumbago Crucible Company likewise manufacture and import clay crucibles, muffles, portable furnaces, &c., stove backs, all descriptions of fire-standing goods, and every requisite for the assayer and dentist.

For lists, testimonials, &c., apply to the Patent Plumbago Crucible Company, Battersea, Works, London, S.W.

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The Mining Journal.

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1372.—Vol. XXXI.

LONDON, SATURDAY, DECEMBER 7, 1861.

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MR. THOMAS SPARGO, MINING ENGINEER, STOCK

AND SHAREBROKER, 224 and 225, GRESHAM HOUSE, OLD BROAD

STREET, LONDON, is enabled, through his long experience as a practical miner, aided by his bi-monthly visits to Cornwall, Devon, and Wales, to give sound advice and accurate information on the position and prospects of the various mines in those counties.

Mr. Spargo has for sale SHARES IN MINES paying from 20 to 25 per cent. per annum in bi-monthly or quarterly dividends, and also a number of shares in progressive mines at a low figure.

The following works are published by Mr. Spargo, viz.:—Statistics and Observations upon the Mines of Cornwall for 1859; ditto for 1860; Physical, Geological, and Parish Map of Cornwall; Geological Map of the Various Mining Districts of Cornwall, embracing upwards of seven hundred mines, showing boundary lines of every mine, with the lodes, cross-courses, and elvan courses traversing each; and a relief Map of Cornwall. The mines in these maps are arranged under three heads, viz.:—Dividend mines; mines returning ores, not paying dividends; progressive mines, and mines abandoned, thus showing the real position of every mine, with the surrounding districts, so that the most true may, at a glance, understand the character and value of the property in which they may wish to invest.

Dividends received, calls paid, and all orders negotiated on a commission of 2½ per cent.

MR. GEORGE BUDGE, SHAREBROKER, No. 4, ROYAL

EXCHANGE BUILDINGS, LONDON, E.C. (Established 14 years), has FOR

SALE 10 East Caradon, £27½; 2 East Basset; 10 Wheel Grylls, £15½; 3 Herodsfoot; 25 Roseall Hill and Ransom United; 2 Wheel Seton, £137½; 50 East Carn Brea, £27½; 50 Uity, 15s.; 50 West Tolvadden, 3s. 6d.; 1 South Caradon; 35 Grenville, 32s.; 1 Devon Great Consols; 25 North Croft, 40s.; 40 West Margaret; 100 Cuddra; 25 East Russell; 100 Great Wheel Martha, 25s. 9d.; 50 North Miners, 24s.; 50 Wheel Edward; 20 South Condurrow, 7s.; 50 Wheel Norris, £2¼; 100 North Nant-y-Mwyn, 2s. 6d.; 20 Crelake, £2¼; 50 East Grenville; 60 Dale, 14s. 6d.; 35 Wheel Uity; 42½; 5 South Bryn Gwlog, £2; 3 West Bryn Gwlog, £17; 25 Lady Bertha, 14s. 6d.; 4 Long Rake; 100 Great Caradon, 7s. 6d.; 50 St. Day United, 11s.; 3 West Caradon, £51; 4 West Basset; 50 Crane; 20 Collicombe; 100 Ribden, 4s. 6d.; 2 Wheel Margaret; 50 Crookhaven; 100 Lady Eliza; 50 Wheel Arthur, 14s.

Parties who would be induced to buy or sell shares by the recommendations contained in circulars or advertisements, would do well first to submit their offers to Mr. BUDGE.

G E O R G E M O O R E,

1, CROWN COURT, THREADNEEDLE STREET.

In any business that GEORGE MOORE is favoured with, in which he is the buyer, he will give CASH ON RECEIPT OF TRANSFER.

JAMES HERRON has FOR SALE the following SHARES, at

the prices quoted, and FREE OF COMMISSION:—

10 Alfred Consols, 12s. 9d. 2 Herodsfoot, £39¼. 1 So. Wh. Frances, £29.
1 Basset. 10 Holmbush, £1 4s. 5 Silver Rake.
20 Rosebud, 19s. 1 Kitty (Leland), £5 2s 6d. 20 St. Ives Wheel Allen,
5 Bryn Gwlog, £27. 20 Kelly Bray, 15s. 9d. offer wanted.
2 Billins. 50 Lady Bertha, 14s. 1 Trelawny, £16½.
20 Bottle Hill, 12s. 9d. 2 Long Rake, £13 18s. 9d. 40 Tamar Con., £1 7s.
5 Cobre, £35½. 5 Ludcott, £3 12s. 6d. 10 Tincroft, £8.
5 Camborne Vein, 42s. 40 Moland, 9d. 10 Tolvadden.
20 Carn Camborne, 16s. 9d. 5 Marke Valley, £10 6s 9d. 10 Treloweth.
1 Cargill, £15½. 20 Manchester & Festinlog. 3 W. R. Down, £10¼.
2 Cook's Kitchen, £22½. 2 Mary Ann, £16 15s. 5 West Stray Park, £3½.
5 Calvadnack, £7½. 50 North Miners, 23s. 9d. 20 Wheel Uity, 14s. 9d.
20 Cherotte United, 21s 9d. 50 North Basset, £3 2s. 6d. 1 West Seton, £297½.
30 Cuddra, 38s. 6d. 1 No. Treskerby, £24. 2 W. Basset, £13 15s.
50 Collicombe (an offer 10 North Downs, £5¼. 160 Worthing, 11s.
wanted). 20 New Frances, 5s 9d. 1 Wendron Con., £10¼.
3 Clifford Amalgamated, £20½. 20 New Treleigh. 20 Wh. Grenville, 31s. 6d.
2 Caradon Consols. 20 North Rhine, 12s. 20 Wheel Harriet, 20s 6d.
1 Condurrow. 2 No. Roseall, £17½. 20 Wheel Crober, 9s. 6d.
20 Calstock Consols, 6s. 9d. 10 North Buller, £3. 10 Wheel Edward, £3.
50 Dale, 13s. 9d. 15 North Robert, 19s. 6d. 5 Wheel Uity, £4 8s. 9d.
30 Drake Walls, 19s. 9d. 10 North Haled, 10s. 20 West Polmar, 6s. 9d.
50 Deep Level, 6s. 9d. 5 North Croft, 40s. 40 West Devon Cons., 2s.
10 East Russell, £2 18s. 9d. 7 Old Tolgus. 2 West Sharp Tor.
5 East Carn Brea, £10¼. 1 Providence, £41. 20 West Carnarvon, 6s. 6d.
30 East Grenville, 32s. 5 Par Consols, £7 6s. 9d. 20 West South Caradon,
4 East Caradon, £27½. 5 Pendon, £4½. 17s. 9d.
20 East Koneberg (fully 24 Prosper United, 39s. 6d. 10 Wheel Grylls.
paid up £5). 20 Polgar. 10 West Caradon, £51.
50 East of Red, 27s. 6d. 1 Rosewarne Utd., £19 15s. 15 Wheel Hearle.
2 E. Devon Cons., 38s. 9d. 20 Roseall Hill, &c., £3¼. 1 West Bryn Gwlog, £13
2 East Basset, £63. 50 Ribden, 4s. 6d. 10 West Trevelyan, £2.
2 Gt. Fortune, £12½. 5 St. John del Rey, £50½. 10 West Wendron, 4s. 6d.
2 Grambler, £20. 1 Stray Park, £31¼. 20 West Condurrow (offer
20 Great Alfred, 9s. 6d. 20 So. Condurrow. 20 West Silver Bank, 20s.
50 Great Moelwyn (£115s. 10 Wheel Seton, £127. 1 Wheel Emma, 20s 6d.
20 Great Grinnle, 18s. 9d. 30 Sortridge Con., 13s. 3d. 30 United Mexican, £3¼.
20 Great Wheel Vor. 15s. 6d. 20 Wheel Norris, £2¼.
50 Great Martha, 26s. 3d. 30 St. Day, 10s. 3d. 2 Wheel Damsel, £13.
30 Great Retailack, 17s. 6d. 5 S. Bryn Gwlog, £10½. 20 Wheel Uity, £2½.
15 Hingston Down, £4½.

And a BUYER OF 50 Roseall Hill and Ransom United at £2; 5 Wheel Grylls,
20 St. John del Rey, 10 Billins, 100 North Miners, 30 East Carn Brea, 20 Wheel Arthur,
5 Bryn Gwlog, and 50 West South Caradon.

Mr. HERRON has, during the last four months, constantly recommended his friends to

purchase shares in Roseall Hill and Ransom United at prices ranging from 23s. to

26s. 6d., which are to-day saleable at 60s. to 65s.; and should the mine continue to

look as well as at present, the shares must advance to a much higher figure.

Mr. HERRON has selected four other progressive mines selling at a heavy discount,

which in his opinion possess equal chances of success, and he will be happy to consult

with those who wish to invest in mining property.

2, Adam's-court, Old Broad-street, Dec. 6, 1861.

MESSRS. VIVIAN AND REYNOLDS, 68, OLD BROAD

STREET, LONDON, E.C., MINING ENGINEERS, INSPECTORS OF MINES,

COMMISSION, AND GENERAL AGENTS FOR THE PURCHASE OR SALE OF MINE

SHARES, RAILWAY, AND EVERY OTHER DESCRIPTION OF STOCK.

Commission on share transactions, 1¼ per cent. on £100 and above, and 2¼ per cent.

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MR. C. POWELL, MINE SHAREBROKER,

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MR. EDWARD COOKE, SHAREBROKER,

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BUSINESS for principals in RAILWAY, MINE, BANK, and INSURANCE SHARES,

&c., at the usual Stock Exchange rate of commission, and from the contiguity of his

office to that institution he is enabled to operate promptly on all orders entrusted to his

charge, either by telegraph or post. The following SHARES FOR SALE, at net prices:

50 Great Retailack, 17s. 50 New South Caradon, 6s. 10 Wheel Uity, £27½.
25 Wheel Uity, 15s. 5 Wheel Grylls, £15½. 20 Sortridge Consols, 14s.
10 South Devon Iron (Pre- 65 Polgar, 4s. 6d. 25 Carn Camborne, 18s. 6d.
ference), 7s. 6d. 5 East Carn Brea, £10½. 10 Wheel Arthur, 17s. 6d.
10 Nant and Penrhin, 8s. 25 Wheel Moyle, £2¼. 10 Wheel Edward, £3¼.
1 Copper Hill, £110. 25 East Caradon, £27½. 10 West Polmar, 7s. 6d.
2 West Caradon, £52½. 5 East Caradon, £28. 5 Wheel Hearle.
2 Long Rake, £14½. 10 Emily Henrietta, £4. 20 So. Herodsfoot, 12s. 6d.
25 North Miners, 23s. 10 North Basset, £39½. 5 Marke Valley, £10¼.

A Map of New South Caradon, together with reports from Capt. Johns, of West

Caradon, and others, sent on application.
Dec. 6, 1861. Bankers: London and Westminster, Lothbury.

MR. GEORGE BATTERS, 5, COWPER'S COURT, BIRCHIN

LANE, DEALER IN BRITISH MINING SHARES AND OTHER SECURITIES.

Mr. BATTERS, from long experience and intimate acquaintance with all Mining Stocks,

can advise as to investment of capital, at closest market prices, and has made a selection

of Dividend paying and sound Progressive Stocks into which he can with confidence

recommend investments at present prices.

The favourable turn in the market for metals, and the cheapness of money, would

point to prices having seen their worst for the present.

Mr. BATTERS is a BUYER of Bryn Gwlog, Carn Brea, Cook's Kitchen, Devon Great

Consols, East Caradon, East Carn Brea, Herodsfoot, Marke Valley, North Downs, Providence,

South Caradon, Stray Park, West Caradon, Wheel Seton, Billins, and Silver Rake.

And is a SELLER of 10 Bryn Gwlog, £27; 50 Bottle Hill, 13s.; 5 Cook's Kitchen, £29½;

10 East Caradon, £27½; 30 East Carn Brea, £9½; 5 Herodsfoot, £39½; 5 Long Rake,

£14½; 20 Marke Valley, £10¼; 20 North Downs, 23s.; 50 North Miners, 23s. 3d.;

2 Providence, £42; 50 Sortridge, 14s.; 50 Wheel Grenville, 32s. 9d.; 5 Wheel Hearle,

£18; 4 Wheel Seton, £127; 5 Trelawny, £16½.

MR. BATTERS has SPECIAL BUSINESS in the SHARES OF

EAST CARADON, MARKE VALLEY, and BILLINS.

MR. JAMES HAMMON, STOCK AND SHAREDEALER,

1, CROWN COURT, THREADNEEDLE STREET, LONDON.

JOHN RISLEY, SHAREBROKER

32, LOMBARD STREET, LONDON, E.C.

GEORGE RICE, SHAREBROKER, 1, FINCH LANE,

CORNHILL, TRANSACTS BUSINESS at current prices net or on commission.

FOR SALE:—
5 Caradon Consols, £9¼. 40 Great Martha, 25s. 6d. 20 Wheel Emma, 25s.
5 East Carn Brea, £27½. 25 Lady Bertha, 15s. 20 Wheel Grylls, 16s.
5 East Caradon, £27½. 1 Ludcott, £2½. 5 Wheel Grylls, £14.
20 East Grenville, 31s. 6d. 50 Sortridge, 13s. 6d. 50 Sortridge, 13s. 6d.
10 Hingston Down, £4. 10 North Miners, 23s. 20 Wheel Edward, £3¼.
10 Great Retailack, 15s. 6d. 20 Tolvadden, £2½. 1 West Caradon, £51½.
1 Grambler, £20. 50 South Phoenix. 1 Wheel Seton, £127½.

There are now some mines on the market the shares of which have had a considerable

rise, and should be sold immediately; there are others which have also had a good rise,

but will go much higher, the mines themselves from discoveries fully warranting it.

GEORGE RICE has SPECIAL ADVICE and BUSINESS in East Carn Brea, East Caradon,

Marke Valley, Wheel Edward, Wheel Seton, Hingston Down, Caradon Consols,

West Caradon, and Wheel Grylls.

Money advanced on mining shares at moderate rates of interest.
Dec. 6, 1861. Bankers: Bank of London.

SALE OF MINING SHARES BY PUBLIC AUCTION.

MR. T. P. THOMAS WILL SELL, BY PUBLIC AUCTION,

at Garraway's Coffee House, Change-alley, Cornhill, on Thursday, the 12th inst.

At one o'clock, the following MINING SHARES, viz.:—

10 Wheel Hearle. 2 West Bryn Gwlog. 5 Herward United.
1 Condurrow. 5 South Bryn Gwlog. 5 Old Tolgus.
1 South Frances. 50 Lady Eliza. 15 Dale.
1 South Caradon. 50 Great Wheel Martha. 20 Carn Camborne.
25 Tolcarne. 20 Cefn Cllicen. 20 Wheel Uity.
3 Ding Dong. 20 Lower Park. 35 Great Retailack.
80 Great Onslow Consols (executors' shares). 20 Wheel Grenville. 5 Bryn Gwlog.
50 Pencairg. 20 East Wheel Grenville. 5 Long Rake.
50 Rosewarne Consols. 20 Great Moelwyn Slate (30s. paid). 10 West Trevelyan.
30 Guryll. 20 Gt. Basset, 6s. 9d. 20 Wheel Emma.
20 Tees Side. 20 Gt. Basset, 6s. 9d. 20 North Miners.
10 Tynnam Consols. 5 United Mexican. 408 Great Caradon (non-payment of calls).
5 Tretol. 10 Marke Valley. 10 Wheel Edward (non-payment of calls).
20 West Wendron. 10 Bryntail. 10 Wheel Edward (non-payment of calls).
20 Prosper United. 1 Brynford Hall.

For catalogues and conditions of sale, apply to Mr. T. E. W. THOMAS, 16, Hackins Hey,

Liverpool; at the office of the Mining Journal, 26, Fleet-street, London, E.C.; or to

the auctioneer, 2, Crown-court, Threadneedle-street, London, E.C.

MR. T. E. W. THOMAS, MINING AGENT AND GENERAL

MINING SHAREDEALER, 16, HACKINS HEY, LIVERPOOL.

Mr. THOMAS has had placed in his hands FOR SALE a number of SHARES in the

MOUNT PLEASANT LEAD MINE, near Mold, a mine likely to be much richer than

at present, but which now pays in dividend a much larger percentage than any other

mine in the list. Prices and particulars on application.

JOHN R. PIKE OFFERS the undermentioned SHARES at the

prices quoted, FREE OF COMMISSION:—

15 Alfred Consols, 12s. 50 Gt. Retailack, 16s. 3d. 4 Old Tolgus United, £10.
50 Bottle Hill, 11s. 9d. 40 Great Martha, 25s. 3d. 5 Providence, £40¼.
4 Billins, £18. 2 Herodsfoot, £37½. 20 Pendon Consols, £4½.
6 Bryn Gwlog, £25½. 30 Hingst. Down, 76s. 3d. 15 Roseall Hill.
10 Calvadnack, £7 6s. 3d. 50 Kelly Bray. 1 South Caradon, £333.
7 Caradon Con., £9 6s. 3d. 60 Lady Bertha, 14s. 3d. 2 South Frances, £28.
15 Cook's Kitchen, £28½. 10 Marke Valley, £10. 5 South Bryn Gwlog, £7.
7 Cuddock Moor, £24½. 25 Nor. Down, £5 1s. 3d. 50 So. Carn Brea, £4 6s. 3d.
2 East Basset, £61½. 100 North Great Work, £1. 100 So. Condurrow, 9s. 6d.
50 East Alfred, 23s. 9d. 2 N. Roseall, £17 18s. 9d. 7 Stray Park, £31.
100 E. Carn Brea, £9 12s. 9d. 100 New Frances, 6s. 9d. 50 Tincroft.
25 East Grenville, 30s. 6d. 2 New Wheel Seton, £46. 100 Tolvadden.
15 East Trevelan, £1. 15 North Buller, £2½. 3 Wendron Con., £10 6s. 3d.
20 East Treskerby, 37s. 6d. 10 North Frances, £2½. 5 West Caradon, £51.
10 Gt. So. Tolgus, 78s. 9d. 5 Nor. Treskerby, £23½. 10 W. Stray Park, £4 3s. 9d.
5 Gt. Fortune, £12½. 30 North Basset, 6s. 9d. 2 Wheel Margaret, £41¼.
5 Gramb. and St. Aubyn. 10 North Bury, £3½. 4 Wheel Seton.
£18½. 40 North Croft, 37s. 6d. 10 Wheel Hearle, £18½.
100 Gernick, 6s. 3d. 50 North Robert, 17s. 6d. 20 Wheel Uity, £4 13s. 9d.
3, Pinner's-court, Old Broad-street, London, E.C., Dec. 6, 1861.

S H A R E S W A N T E D:—

1 Botallack, £225. Kitty (Leland), £5. Clifford Amalgamated.
1 Stray Park, £31. Margaret, £41½. Camborne Vein.
1 Levant. Trencrom, 10s. Lady Bertha, 12s. 6d.
Wheel Seton, £125. South Tolgus, £45.
Commission, 1¼ per cent.
H. B. RYE, 77, Old Broad-street, E.C

Original Correspondence.

VENTILATION OF MINES—No. II.

SIR,—It has been repeatedly stated that a sudden outburst of gas sometimes occurs sufficient to cause an extensive and disastrous explosion, and this, too, by gentlemen whose veracity ought never to be brought into question: but the phenomenon is so unusual, and the liability so great for those who have described such occurrences to be mistaken, that it becomes necessary to receive such statements with more than ordinary caution, and to examine minutely whether they could not be safely attributed to gas being forced out of some of the old workings, or from having more workings open at one time than the air at command can efficiently ventilate. For my own part, I am fully convinced that many coal mines are designated as fiery seams that are nothing of the kind, if they were only ventilated upon proper principles. It is by far too common a practice to make extensions in a colliery without making a corresponding increase in the means of producing a current of air, and in lessening the drag or resistance, by increasing the size of the air courses, and splitting or dividing the currents of air; and, as a natural consequence, the atmosphere of the mine is nearly always at the explosive point, requiring only the slightest derangement of any of the numerous circumstances that thorough ventilation depends upon to make it so. A sad illustration of this want of principle was displayed in the case of the Risca explosion; for if having more works open than the air at command could render safe was not the primary cause of that lamentable affair, it was at least one of the main causes. The Risca explosion raised very grave doubts in the minds of many that Struvé's Ventilator did not possess those advantages over the furnace in practice which it did upon paper or in theory. And if anything more were required to show to the adherents of this system of producing a current of air that its advantages are only apparent, and not real, it most certainly has been done by the recent South Mostyn explosion; for a more signal failure of producing a constant current of air has rarely occurred, nor one that might have been attended with more disastrous results. It is somewhat refreshing to see individuals still writing in its favour, and arguing theoretically that if the machinery happened to be deranged the ventilation would be continued from natural causes. It, at the least, shows that either self-interest runs high in the writer, or that he is not to be hastily or easily changed in opinion, however strong the evidence may be in favour or a change. In support of his unnatural theory he cites cases where natural means have sufficed to keep up a good ventilation for months and years, in extensively worked mines, but the writer referred to fails to say that this can only be relied upon under certain conditions or circumstances, and that if two-thirds of the mines of this country were left to natural ventilation for only a short time, it would be, as one of our Government Inspectors of Mines truly said, "nearly tantamount to the loss of the entire colliery, or its lengthened suspension;" and he might have added the destruction of every life engaged in the mine, except saved by something little short of a miracle.

As a means of producing a current of air the furnace possesses advantages over all other systems yet known, whilst the simplicity of its application renders it beyond doubt the most simple, effective, and inexpensive system employed. I have tried the effect of steam jet and furnace combined, and can cordially recommend it where the furnace is on a shaft that is used for winding or drawing coal, as the steam to some extent neutralises the bad effect the smoke has upon those at the pit's bank, as well as increases the current of air. The producing of a current of air is far from being all that is required in the ventilation of a colliery; for it is not only possible, but frequently is the case, that a good current of air is to be found in the main air courses, but from the imperfect manner in which it is distributed many parts of the mine are very imperfectly ventilated. This is more particularly the case where due regard is not paid to working out the coal upon a proper principle, but upon a system that goes far to convert the greater part of the mine into a series of huge gasometers. When this becomes the case, it is both unwise and highly dangerous to use any light other than the safety-lamp; and it only requires a decrease of atmospheric pressure, or a fall of roof, to force the gas out of its hold, to cause an explosion if the lamp be not constantly used. It is a fact worthy of note that the majority of collieries that have been said to be subject to sudden outbursts of gas have been worked upon systems that will admit of this explanation of the phenomenon.

The main principles of ventilation are simple in the extreme in theory, and it may well startle the theorist when he sees the principles so often violated in practice. For what is easier in theory than increasing the size of the air courses to such an extent that the velocity of the air current would be so low that the drag or resistance would be almost nominal, whilst the increased size of the air courses would admit of an increased quantity of air, in the same ratio as the increase in the size or area of the air course through which the air travels? Simple as this may appear in theory, it is impossible in practice to go on increasing the size of the air courses *ad libitum*. There is a practical limit to the size of all air courses, beyond which it would be folly to attempt to go. It is hardly necessary to say that the area of the air courses must in a great measure depend upon the thickness of the seam of coal, and the strength of the stratum overlying the coal.

Much has been said upon this subject in reference to the recent explosion at the South Mostyn Colliery. One writer casts some reflections upon the management of the colliery, in consequence of the air courses not being more than 5 ft. square. If the writer referred to had had as much experience in colliery management as he appears to have in fault finding, he would have been aware that in many mines it is not practicable to have air courses so large as those he finds fault with.

Another principle, that appears to be very different in practice than in theory, is that laid down in the *Mining Journal* by a writer of some note, under the signature of "M. E." He says—"I venture to lay it down as a correct theoretical principle that the maximum velocity of air currents within a mine should be maintained only in the working faces." In answer to this theoretical principle, I will just observe that in the ventilation of all collieries there must be a main air course, through which the whole of the air that ventilates one side, division, or panel of the workings has to travel. The distance that the air travels in one current depends upon the mode of ventilating, the system of getting coal, &c. Upon the most improved principle of ventilation the air is what is technically called split, or divided, as often as practicable. These divisions of air pass by the working faces of the mine, and it frequently happens that the respective areas of the air courses that these divided currents pass through are as great as those of the main air course, through which the whole current passes before it is divided. Upon what principle then, I ask, can the velocity of the main air currents be kept below that of those which pass the working faces? With as much reason could it be laid down as a correct theoretical principle that the main gas or water pipes of our streets ought to be no larger than the service pipes. Since it is clear that the practical limits of our main air ways are no larger than the branch air ways (if I may so term them), and that the only means of having a greater quantity of air passing through the main air ways or channels is by maintaining the highest velocity of the air currents in them, I have found it difficult to keep the velocity below 20 ft. per second in the main air ways approaching a furnace, whilst it would be utterly impossible for the workmen to work in such a current of air. Many other matters in connection with the ventilation of mines differ as widely in theory and practice, hence the reason why we have so many absurd and impracticable suggestions offered.

Having so recently laid down what I conceive to be the principles of good ventilation, and the means of preventing such awful occurrences as the Risca and other explosions, both in a pamphlet and in the columns of the *Journal*, I shall content myself with making a few general observations on those branches of ventilation that I have either altogether missed or only briefly touched upon. Perhaps there is no single circumstance connected with ventilation of collieries that has been productive of greater loss of life than that of having an insufficient number of shafts. I admit it is expensive to sink shafts to the depths that coal is now wrought in many parts of the kingdom, but I do not admit that as a valid excuse for due protection not being afforded to the miner. Three of the most disastrous explosions that have occurred for a long time have had this for a primary cause; and after nearly 300 lives had been sacrificed, with much property, extra shafts were agreed to be sunk, at the suggestion of the Government Inspectors of Mines, to remedy the evil. It is sometimes the case that one shaft is made to serve the double purpose of upcast and downcast, by having a partition of boards running down the centre. Incredible as this may appear to those who have not received their mining training in the North of England or Scotland, it is yet practised, and the system even has its advocates.

I have not met with anyone who recommends the furnace as a ventilating

agent where the shaft is lined or partitioned with wood, although it has been proved within the present year that it is sometimes practised. If there is one thing more than another that demands legislative interference it is to prevent such recklessness, and to punish the offenders. Whilst thus condemning the shortcomings of the employers and managers of mines, I do not wish to be understood as exonerating either those who hold subordinate positions or the workmen, if they be guilty of jeopardising their own and others lives by some reckless act. It is often a source of grief to me to see workmen compelled to have their power of action circumscribed to such narrow limits that they become little better than automatons, and this, too, in consequence of their inability to act for themselves, or their ignorance of those things which above all others ought to engage their attention—viz., circumstances affecting their well-being, health, and lives. But, as I have previously contended, ignorance in the workman ought not to be accepted as a palliative for ignorance and inability being found in those who are entrusted with the lives of so many of their fellow-creatures.

JOS. GOODWIN.

COLLIERY VENTILATION.

SIR,—I regret the sneering tone of the remarks made by a contemporary on Mr. Goodwin's paper on this subject, read by him at a meeting of the Manchester Geological Society. His views are described as being "nothing very new or valuable." I am certainly not one of those who think it requires anything very new to conduct a colliery in safety. I believe all the necessary principles of ventilation are well known, some by one individual, some by another; perhaps no one individual having a perfect knowledge of all the principles and details of practice constituting the whole science of ventilation. In support of this position, I might direct attention to the fact that one of the most able of the Inspectors of Mines stated at the meeting above referred to that he declined as yet to give a decided opinion on the comparative merits of the old furnace and mechanical motive-power. This was a manly and candid statement; and it must be apparent to any reader that he was not prepared to assert the superiority of the furnace under all circumstances, but quite the contrary in pits of small depth. To admit the furnace being anything but the best and simplest motive-power seems repugnant to the minds of a large number of professional men. The fact is that in this country mechanical power has not been either long or extensively tried; decidedly too little to have it brought to anything like perfect development. Many of those hitherto tried have been more like toys than useful mechanical appliances. Mechanical ventilation is at most only in its childhood ere it reaches manhood. I hope to see it developed to gigantic proportions.

The arrangements of Nixon's ventilator might be easily and cheaply improved; the defect, if any is found in it, will be in the velocity at which such large pistons may be required to travel. I would recommend the large wooden case or cylinder, with the valves and pistons, all to be duplicated, so that each stroke would produce the same effect at half the velocity. I need not repeat what I have said to make it evident that Mr. Goodwin and myself entertain slightly different views on this part of the subject. I expect great things as the result of Messrs. Atkinson and Dickinson's investigations. In the meantime, I dare to offer the opinion that with furnaces, and the proper application of known principles of ventilation, with proper arrangements of lights, that any colliery ever hitherto sunk can be worked with safety. But all persons of every official grade do not fully understand these principles, and the necessary arrangements required. Nor is this to be wondered at, for it is only within a very few years that any thing very much worth reading has been given to the public on colliery ventilation. Such very valuable and useful papers as Mr. Wood's most elaborate essay "On the Steam-Jet," Mr. Atkinson's highly scientific essay "On Ventilation," or the late Mr. Wales's thoroughly practical application of the details of ventilation, are but comparatively recent productions, having been only a few years at most before the public; probably we are, in addition to the gentlemen themselves, much indebted to the originators of the North of England Mining Institute for their possession at all. Before 1850 all the information published on this subject was little more than scattered fragments, hard to find and difficult to obtain. Even at the present time the oldest truths and simplest principles known cannot be too often repeated, were it only for the rising generation of colliery officials. The alphabet is no modern invention, no new thing, yet it is after all the initiatory step in the pathway of knowledge, and also a very important step to those taking it for the first time. I am sick of this twaddle about correct practices to ensure safety in ventilation not being new; they are not wanted to be new, they are wanted to be known more generally—universally known. If I could learn a person, hitherto ignorant of the process, how to open and shut a door, how to attend properly to a furnace, how to properly light and lock a safety-lamp, how to put up a length of air-brattice, or a danger signal, or any other equally indispensable, simple, every-day detail, I would also feel it a pleasure, and also a satisfaction, knowing I had contributed something to the general stock of knowledge of the human family. A good deal of what is necessary to the safe conducting of a mine has been done millions, and is being done thousands of times daily, but their importance is not thereby lessened—rather increased.

The value of a recommendation is its utility. Is there any one thing in ventilating a colliery of more indispensable necessity than Mr. Goodwin's old recommendation of keeping the air-courses open? You might with equal propriety try to pass a 12-inch pipe through a 6-inch one as try to get efficient ventilation with inadequate area of air-ways. The laws of Nature cannot be evaded or violated without retribution. Many good old practical pitmen did not believe air to be governed by laws at all—that it is so cannot be too frequently enforced. Nor can the nature and operation of these laws be too frequently or too fully explained. Whatever amount of knowledge a man possesses, if he is willing to be at trouble to himself to impart it to others for their benefit, at least he deserves our respect. The proper splitting of the air, or its proper application to every part of the mine, although not by any means a new idea, is justly considered one of the most important principles in mine ventilation. It is also one of the greatest discoveries and improvements that has taken place in this department during the present century; indeed, there has been nothing like it.

Are these principles universally practised throughout the coal trade of Great Britain? I fear the answer must be in the negative; and why so? I would not dare to leave undone anything I understood and found to be necessary for the safety of the workmen under my own charge, and in charity and fairness I am bound, in the absence of specific proof to the contrary, to believe that every other person similarly situated acts upon the same principle; and when we meet with cases where the simplest, oldest, and most obvious principles of ventilation have been disregarded, what conclusion must be come to? that they have not been understood. Therefore, I say, write on Mr. Goodwin; old or new, correct or incorrect, valuable or invaluable ideas, give them to the world. If useful, some one will gladly receive and be thankful for them. If incorrect, some one will contradict them. The subject will thus be kept alive; it is of too much importance to be allowed to die. Scores will read your remarks in the *Mining Journal* that scarcely know of the existence, or, if they do, cannot reach the other information I have alluded to. It must not for one moment be supposed that I approve of the spirit of general censure which Mr. Goodwin so fully develops. Quite the contrary. In discussing such subjects, the less said about persons, and the more about principles and practice, the better.—Dec. 5.

M. E.

ON THE VENTILATION OF MINES.

SIR,—I see from your excellent *Journal* of Nov. 30, and others, that Mr. Jos. Goodwin is interesting himself much on the subject of Ventilation of Mines,—one, however hacknied in character or theory, that is much and glaringly neglected in practice. I could point out more than one colliery the management of which betrays the qualifications of the managers and underlookers, being subversive of all proper mining regulations, and not very indicative of vigilance on the part of the Government Inspectors of Mines. The condition of one colliery, from which I was a sufferer, I will describe: the inlets and outlets for air were abundant, with furnace erected to increase ventilation. But the genius of manager and underlooker had invented no less than four ways of stopping the only main and proper air-course, compelling the whole of the air to pass through a space not more than 12 or 18 inches in area within 15 yards of the furnace, which was lighted. If their own inclination suggested it, imagine a mine surcharged with what miners call "black damp," with some two or three scores of acres of old and new workings open, and 50 or 60 men and horses depending month by month on such ventilation. Mr. J. Goodwin very frequently intimates as to the negligence, incompetence, or ignorance of managers or underlookers. Does he not know that the ignorance of three-fourths of the underlookers is proverbial, and is the cause of incompetency, negligence, and recklessness, so often complained of, but little effort made to remedy, though the mining districts groan beneath it. I am persuaded, from very recent experiments with fire-damp and other gases, that pure air is the best and only proper remedy for foul and dangerous gases, and that it can be had in sufficient quantity by any, or nearly all, the means suggested for ventilation, if the down-cast and up-cast, with the air-courses, be kept uniform and efficient, in proportion to the area and the number of men employed.

We miners look upon lamps as a most beneficial invention for indicating where danger is; but we deem them an unwarrantable abuse when made a substitute for pure air. We say that, in most mines there is a quantity of gas given off, it is prudent and essential in certain places to lock the lamps, and to see that the miners have no

means of unlocking them. But at the place where they are perpetually locked at work may I never be consigned to earn my bread. We deem it rather a strange policy for officials to be laying down rules how the miner shall manage his lamp in places full of gas, when four-fifths can neither read the rules nor efficiently the indication of the lamp. Would it not be more rational for us to lay down a rule to have such a quantity of air in each place generally as to be safe in putting away the lamp, which most men able to judge affirm can be done, and that economically, too? I propose that as a means to save money, saying nothing of saving hundreds of useful lives.

I need not intimate to inspectors and managers that air-ways may become straitened by falling or lifting at the bottom of the pit, especially the return air-ways, before they are in any way notified on the maps. Mr. Chorlton, who was so angry with Mr. Goodwin at the Manchester Geological Society, would find it difficult work to map every air-way once or twice a week in ten or twelve pits, if like some that I have seen.

Lodge-lane, Duckenfield, Cheshire, Dec. 4.

CHARLES BRADLEY.

THE LYNCH COLLIERY CONTROVERSY.

SIR,—I have read in the *Mining Journal* several communications referring to the accident which occurred at the Lynch Colliery, near Llanelly. In the *Journal* of Nov. 30 there appears one letter headed "Responsibility of Colliery Owners and Agents," signed R. W. Perkins, and another headed "Colliery Workings—Government Inspection," and signed C. G. Bateman. From the great cry made by interested parties in the matter of the Lynch Colliery prosecution, I fear you and others have been imposed upon, and led to believe the law has been unfairly applied in this case, and that some great principle is involved in the question; this is not, however, the case. It is very well known in the district that the place where the accident happened was a dirty "hole," certainly not deserving the name of a colliery, and that from the bottom of this "hole" a heading was being driven seaward; and under the marshes: that old workings were supposed to exist in that direction, and that for some time before the accident occurred the dropping, or water in the heading, had been increasing, that the proprietors paid for bore holes to be kept in advance of this heading, but that although paid for they were not made.

The Inspector would have had no difficulty in bringing forward independent evidence to prove these things. The magistrates inflicted a small penalty only, and the general impression in the district is that the proprietors were principally to blame for not having an efficient agent, who would not only pay for bore-holes when he thought them necessary, but would also see that they were made. My main object in troubling you is to call attention to this point, as all parties having the charge of collieries cannot be too particular in actually seeing that bore-holes are kept in advance when necessary. Mr. R. W. Perkins is brother to Mr. F. H. Perkins, of the Lynch Colliery, and is a shipper of coal at Llanelly, but I am not aware of his ever having had the management of a colliery. Mr. C. G. Bateman, until lately, had the management of a colliery in this district, and, as a friend, aided Mr. Perkins by giving evidence before the magistrate, and these are the gentlemen who, failing to convince the magistrates, are, through the *Journal*, endeavouring to get up a great cry about this very little colliery, and against an Inspector for doing his duty in the mildest possible manner. Llanelly, Dec. 4.

ONE FROM THE DISTRICT.

BOILER EXPLOSIONS.

SIR,—I wish to assure Mr. Sims, in reply to his letter which appeared in last week's *Journal*, that it was with no antagonistic spirit that I replied to his communication on boiler explosions, unless expressing a difference of opinion can be construed into such, and on looking over my reply I see no reason for such an accusation. The subject of boiler explosions is far too important to be discussed in any other than a calm and impartial spirit, and it is in such a spirit that I have entered into the discussion. It is needless for me to follow Mr. Sims through his last letter, as my opinion of the value of glass water-gauges and alarm-whistles have been already expressed, and with all due difference and respect to the value Mr. Sims considers his long experience may entitle him to, it will in no way deter me from strongly recommending their application, and I confidently appeal to the managers of those mines where we have them at work as to the absurdity of my statement on the amount of care and attention required to keep them in good working order. There may be exceptional cases, and I believe they are exceptional, where the water is of such a corrosive character as to render whistles in a short time inoperative; this, however, is no reason for a general condemnation of them. But glass gauges are not only useful, even for the inexperienced to see when the feed is low, but equally so for the engineman to prevent its getting too high. With the ordinary cocks the engineman can only judge (after the water is above the top cock) how high the feed is by the length of time the feed has been going. That it does at times get too high there can be no doubt—indeed, an instance only yesterday came under my notice where the feed was so high that it was actually forced up through the safety-valve; this may be ascribed to neglect, but it arose from an excess of caution, which a glass gauge would have been the means of preventing. My reason for supposing that Mr. Sims's plan of fixing cast-iron rings in the tube would be useless is, believing that the majority of accidents arise from the water either from accident or other neglect being below the back of the tube, the tube becomes heated until it is no longer able to withstand the ordinary working pressure of steam in the boiler. I say ordinary pressure because in the accidents that have come under my notice there have not been any evidence of the ordinary working pressure being increased. That the tube must be heated to a considerable degree cannot be doubted, or it would not collapse. Now, it is well known that cast-iron does become very weak and brittle when hot, and of a very much less strength compared with wrought-iron under similar circumstances, and there being nothing to prevent these rings in the tube becoming heated to a higher temperature than the back of the tube itself, how can they assist to prevent its collapsing. If Mr. Sims thinks I am wrong in the statement I have made of the relative strength of cast and wrought-iron when hot it can be very quickly tested, and I rest assured that it will substantiate the opinion I have expressed.

J. HOCKING, Jun.

Redruth, Dec. 4.

EASY WINDING CYLINDERS.

SIR,—Since winding machinery is mooted in the *Journal*, allow me to explain a very simple, safe, and economical mode of raising earths, &c., from mines, whether the shaft is perpendicular or hypotenoidal, which I have not seen working in England. Place a horizontal axle, with a drum on it, directly over the opening, then on the same axle fix another drum, as much larger as will equipoise similar given weights pulling opposite ways against each drum, when the loads are in equilibrium—that is, if a ton is required to be brought up 100 feet, by a band passing round a wheel 6 feet diameter. The other wheel on the same bearings must be made as much larger as will enable corresponding weights to slide or roll down the outside incline, as will about overcome the opposite pressure. For instance, where any locale can be worked having a corresponding fall outside, no difficulty can arise. Take, for argument, the Criceth, Rhosydd, or other excavation from a nearly level surface area, you can furnish several hundred feet of gradual descent somewhere; then all that is required is to form an incline to the bottom of the inner workings, at an angle of (say) 50°, then form another incline, from the uppermost part towards the fall of the ground, of such an angle and length most suitable to place the debris, &c., thereby making the circumference of the respective drums to coincide with the relative force pressing on each incline, while one side is descending with its load to cause the opposite wagons to ascend with an equal load, and *vice versa* with empty wagons, then the main thing is always to keep one full and one empty wagon on the summit ready for descending balances, to regulate any little difference in the counterbalancing loads, the axle of the drums might be assisted by manual, horse, or other power, or the wagons themselves might be followed by men or horses to regulate any difference of weight, speed, &c. But if (say) 2 tons are required to haul up 3 tons, then the largest drum must be sufficiently great to overcome the smallest one, winding up the heaviest load along a much longer incline; hence, when one cylinder is double the diameter of the other, the speed of the longest incline must be also twice the ratio of the other, if both sides are simultaneously to be travelled over by either full or empty wagons.

G. F. GORLE.

December 2.

GOLD IN WALES—THE PRINCE OF WALES MINE.

SIR,—While driving along the other day on the Dolgelly road I spared a short time to inspect the Prince of Wales Gold Mine, but as the captain of the works was not at hand I contented myself by looking down into the earth below. I then walked a few hundred yards nearer the toll-gate to enter an horizontal adit, about 100 yards from which I extracted a specimen of the spar, while another piece from the perpendicular excavation I picked up where the road was being mended. These two samples I afterwards tested, the first being merely a piece of plain, light-coloured quartz, and not a trace of gold or other metal was found in it; whereas the dark coloured spar plainly exhibited stellates of auriferous galena, which on analysis gave out about 4 ozs. of pure gold to the ton of matrix, independent of the lead it contained. These two samples, promiscuously picked up, and others, convinced me there is plenty of gold in Wales, only re-

quiring competent and unprejudiced scrutinisers to develop it; at the same time, it is only wasting money to operate on stones yielding no metallic returns—as a proof, at least three-fourths of the crude stones now being broken up at the Prince of Wales Mine ought never to have been associated with the other quarter that furnishes the precious metal, for although most practical men may know tin, copper, lead ores, &c., when put into their hands, few miners, or even mineralogists, seem to know golden ore when handled. If, therefore, local managers expend twice as much ready cash than absolutely requisite, how can great profits be realised? On the other hand, while prospectors in Wales are deemed intruders, it will perhaps be unthankfully received by certain narrow-minded persons to publicly assert that there is an unproved auriferous lode close by the before-mentioned highway, and if the landowner will grant us leave the proof shall be forthcoming by the discoverer.—*Maentwrog, Dec. 2.* G. F. GORLE.

THE INTERNAL HEAT OF THE GLOBE.

SIR,—It is very pleasing to read letters from an old traveller like Major Parib, who has studied the operations of Nature as they are seen, and who is too independent to be induced to modify his notes to suit the theoretical fashions of the day. The concluding remarks in his communication are similar to those I made in my work on "Geology and Magnetism," chap. xix., on Volcanoes and Earthquakes:—
"These examples of eruptions, would scarcely be perceptible on a globe of 3 ft. diameter and, probably with few exceptions, would not penetrate to the depth of the varnish coating."—"I have studied them, from the magnitude of the Andes to the diminutive dimensions of mole hills."—"In the district around the volcano of Tungurahua, in Quito, at the foot of the Parimo, the earth was rent open, and streams of water and foetid mud with fish poured out, overflowing and wasting everything."—"During several of the eruptions along the coast of Chili, since 1822, were seen great whirlpools, as if the sea was pouring into the interior of the earth."—"The volcanoes of Nicaragua during their activity are commonly attended by whirlpools. Had there been an igneous nucleus, as the one assumed, covered only by a thin crust, what would be the consequence when the sea happened to pour into it?"—"There would certainly follow some awful catastrophe, but we are happy to state no such convulsions have occurred."

The earth predominates in water as the essential element of activity in the mineral as well as in the vegetable and animal life.

It might be supposed, according to the reasoning of some professors and lecturers in natural philosophy, that this globe of ours was not originally made for the purpose of planting the vegetable and sustaining the animal kingdom, as now established. No; it was made like a fire balloon or a rocket, for the amusement of future philosophers and their disciples. We find grave professors commencing their lectures thus:—

If a sphere of very large dimensions, like the earth, were heated in any degree and in any manner, and were left to cool in surrounding space, it is shown by accurate investigation that, after a sufficient and very great length of time, the law according to which the temperature would increase in descending beneath the earth's surface, within depths small compared with the earth's radius, would be that the increase of temperature would be proportional to the increase of depth." And it is said that "this coincides with the observed law, if we neglect the anomalous irregular variations which are found to exist more or less in each locality."

A theory founded on such an assumption, and on so very limited and imperfect base, is not worthy of a moment's consideration.

It is said that the public in general are more pleased with romance, fiction, and anything extravagant, than with true and faithful history. This may account for the encouragement the igneous theory has received. Those, however, who prefer to study facts, and reason thereon, will find that our globe is very differently constituted, and is enveloped by the ocean over an area equal to about three-fifths of the entire surface, and to a considerable depth. The dry lands also, with their lakes and rivers, contain upwards of 50 per cent. of water, as deep as we can reach. The eruptions or volcanic emanations in New Zealand, Australia, Java, India, Philippine Isles, China, South America, Central America, California, Iceland, &c., are aqueous products of acidulated and alkaline waters, sometimes very hot, and contain silica, potash, soda, lime, magnesia, &c., in solution. The few igneous volcanoes known are only inflamed occasionally, like the production of lightning during storms, and are comparatively as superficial in their igneous effects as the flames issuing from marshes, collieries, or gas pipes. The immense amount of heat absorbed by the earth daily from the sun's rays, the constant circulation of the magnetic currents from pole to pole, and the chemical activity produced thereby in the crystalline film of our earth, are quite sufficient to account for all terrestrial phenomena, without our having recourse to the impossibilities of the igneous doctrine.

EVAN HOPKINS.

ON THE INTERNAL HEAT OF THE EARTH.

SIR,—Mr. Hopkins states in the first paragraph of his last letter, "Although the term heat commonly implies the sensation which we experience on approaching a fire, yet heat is frequently produced without fire." I presume Mr. Hopkins means by the word *fire* the elementary principle of heat (caloric), which pervades all matter, and all space, in its various functions of heat, light, electricity, &c.; if so, perhaps, he will oblige us with his rationale that heat is frequently produced without the aid of fire? It is exceedingly unphilosophical to assume (where we have direct evidence to the contrary) that heat, light, electricity, gravitation, chemical affinity, &c., are conditions of something, which something they who hold the doctrine of the nonentity of caloric do not attempt to explain; or if they do attempt an explanation they throw around themselves, or hide themselves behind, such an impenetrable mist that they can neither find their own way out of it, nor show the way for others to emerge into clear daylight, so that they may have a broad expansive view of the surrounding objects, to see what they are like, tell what they are, and define their various functions. The union, or chemical combination (pressure), of oxygen with other elements shows merely the production of heat, light, electricity, &c., by chemical action. But pressure—owing to the difference in the specific heats of such bodies when under the action of increments of temperature, thus inducing considerable difference in the temperature of the bodies thus acted upon—is the main function which produces heat, &c. The bodies thus submitted to chemical action are brought into closer contact, and the caloric which they held in solution before such action is pressed outwards, thus giving rise to light, heat, &c., as explained in my letter in treating on the production of animal heat. Mr. Hopkins seems to have overlooked the circumstance that I adduced pressure, or, in other words, the gravitating force, as the sole agent which causes the earth's and the various heavenly bodies' heat to increase in a decreasing ratio from near the circumferences to the centres, and the differences of temperatures from the centres towards the circumferences must, therefore, increase in an increasing ratio—i.e., in the ratio of the increase of gravity in the same direction. If the theory of pressure as thus broached does not amount to demonstration, I must leave it to Mr. Hopkins to tell me what demonstration is. No heat, light, electricity, &c., could possibly be produced were temperature equable. No electricity, it is well known, can be drawn from the transparent equable temperature of the high-pressure steam of a steam-boiler, it is only where condensation is taking place that such can be had; this has been proved over and over again. We may thus rightly infer the origin of water and of air. When the earth began to condense into its globular form, the production of heat by the pressure of gravitation would evidently cause the gases which form water and air to be evolved. What, I would ask Mr. Hopkins, could be more simple and self-evident? Although Mr. Hopkins may be a good practical geologist, still he appears to me somewhat like many good practical mechanics, chemists, agriculturists, &c., who despise all theoretical knowledge of their arts, who are fond of viewing effects, but never think of investigating the causes which produce them.

With regard to Mr. Hopkins's observations on the temperature of the surface water in high latitudes being often near the freezing point, while that at the depth of 260 fathoms is almost constant at 40°, he is again obviously playing into my hands. When the atmospheric temperature is in or about the freezing point, and evaporation from the ocean's surface (from a warmer medium into a colder one) rapid, the chilled surface water, which has parted with a portion of its caloric to the evaporable molecules, will naturally (unless it becomes fixed into ice) descend to the bottom of the ocean, where the high pressure (say, a column of 260 fms.) will very naturally cause the temperature to rise at the bottom considerably above the freezing point—say, up to 40°. This goes far to establish my theory by direct demonstration. It has, indeed, been proved that the water under severe hydraulic pressure generates heat in the ratio of the pressure (see an article on this subject in the *Engineer* about a fortnight ago); Mr. Hopkins has, therefore, put into my hands one demonstrative fact, the *Engineer* another; but many more might be adduced that heat increases in the ratio of the pressure. Hence the heat must increase in a decreasing ratio from near the circumference to the centre of the earth. These facts are no assumptions; they prove my theory from physical facts, some of which Mr. Hopkins has unconsciously supplied, as demonstrably as a proposition of Euclid, at least to any man who is able to comprehend a demonstration from known data. I know nothing about the Tamar Mine, but the "West of Cornwall" cannot be very many miles from a mountainous district. These hardly deserve comment, as the waters of mountain

tops and sides drain through substrata, and discharge themselves either through the bottom of the ocean or into rivers; very often far away from the mountains where they were first deposited. Mr. Hopkins further remarks—"We must wait until we see the demonstration. It will be a curiosity to see a thin crystalline globe retaining incandescent matter for an hour without being melted." Mr. Hopkins seems to write like *un homme sans connoissance*. Did I not explain in my former letter that the heating force acts outwardly from the centre, and the gravitating force in the opposite direction towards the centre—that they obviously mutually generate each other—that they are, in fact, co-equal and co-existent, holding each other in equilibrium, and, therefore, preventing each other's escape? It is a well-known fact that we can infuse a much larger quantity of heat into a given quantity of water when under severe pressure than when the pressure is slight or removed. What further demonstration does any reasonable man need than this? The earth's internal heat cannot, therefore, escape under the conditions of permanent equilibrium of forces. Earthquakes are, doubtless, produced by surface magnetic currents. Mr. Hopkins, near the close of his letter, appears to be inclined to sap the very foundations of the "Principle," and the fundamental principles of astronomy. The untenable drift of his argument relative to "the external attraction of a hollow shell of small thickness is equal to a solid one," bears its own confutation as connected with the mean density of the earth. As regards the remarks of "An Old Traveller," who has introduced "the precession of the equinoxes" into the subject, I cannot conceive what precession or nutation has to do with the earth's central heat. Newton, in his "Principia," prop. 39, B 3, demonstrates that the precessional revolution of the equinoctial points is produced by the combined action of the sun and moon on the protuberant matter about the earth's equator, and which protuberance is caused by the earth's axial rotation.

WM. STEVENSON.

MINERAL VEINS AND THEIR BEARINGS.

SIR,—I shall, with your permission, make a few remarks, in treating on mineral veins and their bearings, on the work entitled "The Laws which Regulate the Deposition of Lead Ore in Veins." I am rather amused at the following, from Alston Moor, because most of the mines are under the direction of the proprietors:—"In the North of England the mining agents are chiefly selected from among the workmen, on the supposition that their experience will enable them not only to propose suitable trials, but also to plan and direct the mining operations in the most effective and economical manner." Are the Waltons, Millicans, Curries, Cains, Nevens, &c., the selected, or where are they? But it is manifest that employment in such labours affords no suitable training for those whose province it is to investigate the most difficult problems of geology and mineralogy. Why not? It is from practical working the best experience is to be gained, and all those I have named are men who have worked in the mines for knowledge, and I am sure you cannot surpass them. Mr. Wallace must be aware, if he knows anything of the district, that the professors of geology and mining, who have had the direction of mines in the North, have made most egregious mistakes. But we must examine how far Mr. Wallace, by his own experience of the "inductive and deductive reasoning, and the long course of philosophic and logical habits of thinking," is able to judge, and we shall see in the sequel how it is in practice. In the first place, there is no mountain limestone in the Alston Moor strata, nor any on the Cross Fell range. The carboniferous line named on the Geological Map is in the Alston Moor strata, 600 yards deep or upwards. The Fall top limestone of Alston Moor strata is only 25 ft. in any district. The great or 6-fathom limestone, the principal lead-bearing post, has three or four bands below it; and then comes the Cross Fell strata, the Great Bundle Lime—44 yards, but that is beneath the whim, which is here 47 yards, and not, as Professor Sedgwick says, a basalt dyke; and then we have three more limestones with the other strata. It is laid down on the Geological Maps as the "upper limestone shales." But how they turn whin, freestones, sandstones, and plate shales, from 4 to 48 yards deep, into limestone shales, I leave Mr. Wallace to say, and also which limestone it is the "laws have deposited." The universality and uniformity of Nature's laws—if such there are—have nothing to do with the earth, veins, or their contents in forming them, they are as they were created, and the comparatively small increase of crystallisation is purely chemical. The earth is stratified, but not in uniformity, nor ever was; it is the diversity that makes it habitable and healthy, and causes the changes essential to man and animals. Mr. Wallace has adopted the drift glacial theory of geology, and is assuming there is a gradual and progressive forming of the earth. And then to account for its diversity, both in strata, rocks, and veins, he attributes their seeming disorder to some deep-seated forces, which he does not explain, and then says—"It will be observed that the antecedent or cause of all these changes and resulting phenomena is simply the subsidence and elevation of a portion of the earth's crust." I am obliged to observe the simplicity in his words—"But what is the cause of this oscillation, and what are the laws of its action?" To these questions Science has as yet furnished no satisfactory reply. Of course, there being no action, Science does not acknowledge the assumed "laws," knowing, or rather teaching, that Nature has no laws always uniform, nor are they eternal.

And now we shall see the working miner's practice, and Mr. Wallace's knowledge of mineral veins, when he states, "There is some reason to conclude that the great sulphur vein is later formed than the east and west veins, on account of the acute angle of intersection." But the east and west veins do not intersect this vein at the acute angles stated, the direction being half a point west, and so states Mr. John Leithart, who was agent for Greenfield Hospital, and worked this sulphur vein; he states it to be "a half point north-west vein, carrying gold, copper, and lead; it is from 20 to 50 feet wide; in some strata, as at Cask Burn Force, solid quartz, has a 20 fms. throw, with an underlie of 10 fms; in 10 fms., and known in coal measures as a fault 30 yards wide." The above, with a slight error, is true. The vein crosses from the North Sea to the Solway Frith; and on the south wall every stratum is up from 3 to 60 ft., as regular as the strata. If you consult Sir Roderick Murchison and Professor Ramsay's Geological Maps, you will find that they lay down the strata and rocks; it is seen on the sea coast; passes through the upper and lower colts, lias, and trias millstone grit; then through the Cross Fell strata, part of Alston Moor strata, conglomerate, old red sandstone, and new red sandstone, to the Solway Frith. Now, it is very evident it must be as old as all these rocks and strata, or it would not appear in them; every strata being lower to the north and elevated to the south and west, proves they must have been found together. Just fancy this being one great fissure, or merely a fracture in the strata. Mr. Ennor says North Countrymen do not know a south course from an east and west vein; and who could contradict him, if Mr. Wallace's statements were taken as exponents of their knowledge? But, in the tracing out the east and west veins this will appear much more ridiculous, which I shall do in my next, taking a vein which has returned the proprietors 20,000l. a year for some years. It is very certain Mr. Wallace has not traced these veins out, or he could not assume such positions, so at variance with facts.

G. ATTWOOD.

THE GEOLOGICAL FORMATION OF THE EARTH—No. IX.

SIR,—My last communication having closed with remarks on coal formation, I will next make some observations on the impressions of plants being found in coal and other bituminous rocks. I contend the majority of them are natural emblems, and such as the botanist has not yet been able to give any certain interpretation as to what plants they were. All bituminous matter in its crystallisation is well known to produce impressions, imitating many plants, and even trees,—it is the origin of vegetation striving to propagate; in fact, there is not a rock in the earth but produces a crystallisation of some form or other, agreeable to its own law. After what I have myself seen produced in layers of rock, I am very sceptical as to the prints or emblems of trees or plants being real. As a further proof, I ask, why these rocks containing bituminous matter, or, I might even say, vegetable matter, should in every place produce the same emblems of plants, and the other layers of rocks? I admit it possible that plants or trees might have wafted in the ocean and settled down at the time of the rock formation, as shells did, but they did not grow there. If washed there, they should be found in all layers alike. I should think it far more likely to see in these layers of rock the impression of sea-weeds than of land plants. The shells found in coal, or near it, only go to prove it was formed under water; and no brambles, ferns, or rushes ever grew under sea-water. These things call to mind my going into a coal mine for the purpose of seeing timber-trees, brambles, ferns, and rushes. I could not recognise either; but a man was produced who offered to swear he took out of a rock in a mine 300 ft. deep a large hamper full of blacksmith's rasps, such as is used in the process of shoeing horses, and which, he said, were all taken to the office for safe keeping. I did not ask if they had used them for shoeing horses.

Near Bampton, in Devon, there is an undulating magnesian lime formation; on the top of each summit there is a crystallised form resembling the head of a man with helmet on, and a large roll passing over the top of it, forming, as it were, two faces,—that is, it is alike before and behind. These forms, which appear as though fairly cut off at the neck, I have myself passed off on a learned gentleman as the petrified heads of some of the Egyptians that were lost in the Red Sea when in pursuit of the Children of Israel. There are crystallisations of nearly the same kind found in Dyflife Mine, in Wales, and in some of the Devonian rocks. I have seen them in the public streets in Maenyllth. You may rest assured that I scrutinise every object with a jealous eye, after what I have seen attempted to be palmed off on myself and others. They might as well attempt to get me to believe a blistered stone of iron ore—as one of your correspondents attempted to show of late—was a melted one, as to make me believe the impression shown me in deep rocks from indented land-grown plants. All the up-and-down throws and shells clearly prove these rocks were formed under water, and the shifts are caused by the growth of one layer and decay of another; this I leave to be proved by my own and the theoretical geologists' diagrams. A great deal has been written on marine shells being found in one layer, and freshwater shells in another. This might occur, and, at the same time, all the water on the earth connected, as we have evident proof, that all the water on the earth was not of this character, each new-formed layer and every locality gives convincing proof of this. See the quantity of mountain lime formed in some places, and in others little or none; then see the salt formations in certain districts, when it is not to be found again for 1000 miles. It is clear to be seen that rocks, when forming under water, evidently varied in their component parts within every mile. I am not prepared to say that all these changes of rock were, when first formed, under water, as now found. On its purifying many changes must have taken place, even since it has been above water, still the rock I have named is sufficient to show that rocks must have varied considerably when first formed. Under these circumstances, one part of the ocean, where it was shall, and where little or no currents flowed, and had a great rise or influx of fresh water from springs at the bottom, would cause the water to be fresh for a hundred miles round, and freshwater fish might have come in and increased to great perfection, and left shells plentiful in that locality, which would be ample proof of their once existing there. The fresh water might, again, have subsequently been changed by some bar or rise of sand, or volcanic action, that turned the flow of tides, which again brought in saltwater fish. All these things are possible, and did probably happen, but there is no proof of these spots being alternately above and below the sea; neither does it bear out the law, as now laid down, that the interior of the earth was, and is now, like a burning cauldron, as stated in the *Journal* of Oct. 19, where Sir Roderick Murchison is said to have used the expression—"That the man that will not believe the interior of the earth is like a burning cauldron is an ignoramus." Whether he really did say so, or not, is immaterial, I know him to support the theory of interior fire. I think I met Sir Roderick once; and I beg to tell him that I have had a thousand times more experience as to the earth's interior formation than he ever had,—I have been fifty-five years watching the interior of the earth. I have not the least objection to be placed in the category he names, as I am sure Sir Roderick Murchison and all his

pupils will die a natural death within the next twenty years, leaving not a single monument to record their geological fame. Fully one-third of those termed scientific geologists are already like the weather-cock—waving, and will shortly turn round and take a more sensible view of the rock formation. I was very much amused on my late return from Spain to find a lecture-pamphlet at my lodgings from Mr. H. C. Salmon, with the author's compliments. This gentleman was once a disciple of Sir Roderick's, and, like most platonians, believed the rocks on the Chreswring, in Cornwall, came up so hot that the ancient Druids burnt incense on them. Now Mr. Salmon for the last seven or eight years has been as hard-working as any man that has travelled England. Not like most of the travelling geologists and their pupils (who I call Sunday-going men), this man has been pulling off his clothes almost daily and going underground in mines, where he got all the information he could from the captains, and seeing for himself as well, taking his own views after. He has not only taken mine captains and practical men's views, but he took the views of those best informed in mining districts. See the conclusion come to in his lecture. He has evidently turned his back on Sir Roderick and the fire worshippers, and openly states that mountains were not thrown up sufficiently hot for the ancient Druids to cook their victuals on, but that they were thrown up in a cold, metamorphic, or placid state. How different from Sir Roderick's views. I cannot do better than describe what he says in the general opinion of practical men on this subject. At page 27 he says:—"You will perfectly understand me when I call to your attention the notion so popular among miners, of all times and of all nations, that rocks 'grow'—a conviction so wide spread amongst a class which, above all others, is brought in everyday contact with the actions and appearances of rocks in the interior of the earth. This (he says) is certainly worthy of consideration. No matter how inaccurate may be the language in which it is expressed, it is not so absurd as it at first sight appears, for the action of water on the mineral crust of the earth may not be fully illustrated by what of a simile, by a comparison of that of the action of the blood in the economy of animal life. The blood, charged with certain organic matters, and with the oxygen it receives at the lungs, penetrates through every ramification of the animal body, causing in its circulation a continued change of substances, and a chemical action allied to that of combustion. The water permeating the mineral masses, holding other minerals in solution, and generally charged with certain acids, causes an action not wholly dissimilar, although, of course, on a much less energetic scale. Again (he says), in the in-animated as well as the animated world there is, in truth, nothing unchangeable; the changes which have taken place, and are now hourly taking place, in rock by the slow action of chemical and molecular movement, brought about by the permeating water charged with various and ever-changing mineral matters, must now be estimated as infinitely greater than we could a few years ago even conceive." This is pronounced after a thorough mine inspection; he says not a word about interior fire. I may now say to Sir Roderick that all his college education never made him an equal for a self-taught Practical as to the geological laws of the earth, and he is now too old to learn; I fear he will die with nothing more than a smattering knowledge of the subject. All the travelling in the world and looking at the mountains and surface rock will never bring a man practically acquainted with the interior law of the earth. In conclusion, I will not call Sir Roderick an "ignoramus," but civilly tell him that I defy him to prove there is any increase of temperature generally as we descend into the earth, or that the density of rocks increases, or that they even harden in depth; neither can he prove that any kind of ore forms and accumulates in a large mass below where the oxygen and sulphur pass in sufficient quantities to mineralise and fix the ore. Oxygen will mineralise tin; it is this and ores mineralising with sulphur that pays the miner best. This is a new theory to Sir Roderick; and I hope he will yet catch the infection, discard his burning cauldron, and join with my friend, Mr. H. C. Salmon, in adopting the metamorphic theory, to which I shall next refer.

NICHOLAS ENNOR.

THE MINING SCHOOL, GLASGOW.

SIR,—In my recent tour I had to pass through Glasgow, where I made it a point to call at the Mining School, which, I am sorry to say, is not so well known as it should be in a city whose wealth and prosperity is wholly dependent on its metallic and mineral productions. On arriving at the school I was met by Mr. Mark Fryar, who I found very obliging to a rough country miner, travelling incog. He at once left his pupils, and paid me every attention, showing me all their minerals, fossils, and many drawings. He also took me through the laboratory or chemical department. In this institution I submitted three or four stones of ore (picked up on my journey, and not assayed) for their opinion, on which, like the doctors, they disagreed. I was afterwards, through the kindness of Mr. Fryar, accompanied to the hotel of Mr. Henderson, of Alderley Edge, so celebrated for separating and treating poor copper ores; this gentleman differed from all the others in his opinion on the stones of ore. These stones I have not yet had time to test, but believe them to be good samples of zinc ore, which was not named as such; at once I even pointed out the melting-like stone of iron ore in contention between him and my friend, Mr. Hopkins, but he would not speak out. I was sorry I had to be on my guard, as, had I been in a position to have made myself known, I had many diagrams with me that I should have shown him, with which I certainly think he would have been pleased, but I could not then touch on them, as half a word would have been sufficient for him to have mistrusted me.—*Dec. 3.*

NICHOLAS ENNOR.

MINING IN CARDIGANSHIRE.

SIR,—It is with unfeigned satisfaction I read the comments now so frequently inserted in the *Mining Journal* respecting the capabilities of this once, and again to be, celebrated mining county, seeing they so perfectly accord with the expectations I published about five years since, at which time I was engaged for several months in investigating various localities, most of which have suffered and enjoyed the vicissitudes to which mines are, unfortunately, but too frequently subjected. As considerable attention is now being directed to the valuable deposits of mineral I then went over, a recurrence to a few particulars connected therewith may not be out of place or unacceptable to many of your readers.

My chief and first errand was to the neighbourhood of Llanddwibref, where it was intended to have wrought an extensive series of mines. I was engaged for several weeks in inspecting, in laying down the position of the lodes, and in endeavouring to forward the interests of the company. On my second visit I had the pleasure of meeting my friend, Capt. Rowe, of the Laxey Mine, who had been employed to report also: his answer to the representatives of the proposed company was, that he could neither add or diminish to or from my report, which he thought candid and correct; that in amount was that the mines were well worthy a trial. Circumstances, however, arose amongst the promoters which led to entire disorganisation, and the matter dropped through; not from any want of capacity in the mines, but in the directory. A trial was subsequently made at a point I suggested; a fine lode of copper and lead was met with, but funds were not forthcoming to develop it. An attempt has since been made to work this property, but with no better results, and abandoned, I believe, from the same causes.

Well do I remember the piping hot summer's day that I journeyed from these mines to Pontrhydfendigaid, laden with specimens, to convey which I found it impossible to procure horse hire. Never was I so glad to see the full length portrait of a Red Lion as I was at the hospitable hostelry of James Kemp, who, on enquiry, I found was not only a fellow-countryman, but came from close proximity to a mine I was at that time working (Pencorse). I received and enjoyed that welcome usually accorded under similar circumstances. After visiting the Esgair Mwyn, Lisburne, Frongoch Mines, and admiring their splendid machinery, I was asked the common question, "Do you want to buy a bal?" On replying, that depends upon circumstances, I was told I should see it the next day; this I did, and was so pleased that I made instant arrangements to visit the proprietor: a sum was named, the time limited for payment at the price quoted, and I anticipated a great prize. My attention was then drawn to another mine, at that time just opened; a shaft had been put down by two speculative persons resident in the locality, on the back of a splendid lead lode; a small water-wheel had been put up, but their means prevented further progress. I also tried to bargain for this lot, but the price was so preposterously high, so utterly incompatible with anything like reason, that I was reluctantly compelled to abandon all idea of arrangement. This mine is now the favourite and promising Brynhope.

On my return home I persuaded a capitalist of Leeds to accompany me to mine host of the Red Lion. Illness prevented his being able to visit the village at the time specified, notwithstanding a letter had been forwarded to that effect. We only arrived a day or two too late, and to find that the mine had been purchased and paid for by that acute and profound judge of Cardiganshire mining—Capt. Matthew Francis. This mine is now the Abbey Consols, evidencing that delays are dangerous. The Leeds gentleman referred to being a shareholder in the Goginan Mine, and a personal friend of Mr. J. Taylor's, we spent some days investigating the mines and neighbourhood under peculiar advantages. We were mutually struck with the extraordinary indications presented in almost every direction, a visit to the Devil's Bridge giving an excellent opportunity of observation. The hotel at that time being closed, we were guests of that compendium of Cardiganshire information—Mr. Joseph Scott, whilom of the Duffryn Castle. Here we gained special gratification by visiting a pretty little mine, so called, near the hotel, at that time producing lead and blende in considerable quantities.

A journey through the Hafod estate ended in a determination, if possible, to procure a grant, or grants, to mine that property. The indications of mineral wealth were so positive, so decided, so numerous, as to be perfectly palpable even to a novice. Enquiry, however, assured us that at that time no leases or grants would be accorded, as Mr. Chambers, who had only just completed his purchase, had not as yet made up his mind. To our great regret, this source of mining was entirely closed.

On another occasion, on visiting the great mines at Cwystwith, Goginan and Nant-y-Mwyn, the River Ystwith being that summer very low,

I determined to make an excursion, and search the cliffs that overhang that stream. The information I there gained well rewarded me for my trouble and pains, though for any other cause I have but little to thank Cardiganshire mining, as, in a pecuniary point of view, my experience has been dearly purchased. I, however, must, in justice to myself and to those who have been more fortunate, express my satisfaction and pride that in the Silver Bank and North Hafod Mines the adventures will, if the representations I see quoted from time to time be correct, realise all the riches my impressions at the period I refer to led me most decidedly to believe were embedded in the Hafod estate.

Lockhead House, Nov. 29.

ECONOMY OF MINING OPERATIONS.

Sir,—In my letter dated Nov. 20 I stated that "I believe Captain J. Richards, of the Devon Consols, was the first to sink a shaft on the inclination of the lode from the surface, in order to make it straight, and fit for the introduction of skips." I remember in 1850 and 51, when I was consulted by the proprietors of Wheal Carpenter, regarding the system of development to be adopted at that mine, that it was resolved to sink an incline shaft for pumping and drawing, and Capt. J. Richards adopted the same plan for drawing by skips at the Devon Consols. I saw several shafts on the underlie of the lodes before that time in Cornwall, where chains and kibbles were used, but no shafts made straight for the introduction of skips on wheels.

My old friend Mr. Ennor, in last week's Journal, thinks that I have made a mistake, in stating that Capt. Richards was the first to adopt the plan referred to. I may be wrong, but Mr. Ennor's statement does not prove it. An incline shaft might have been sunk at Trebrugg forty years ago, but it was not made straight for the introduction of skips with wheels and runners. This is the question at issue, and not the mere sinking on the course of a lode and drawing by kibbles. Mr. Ennor admits that incline shafts "are better for wagons than kibbles." Certainly incline shafts ought to have rails and wheels, like levels. Why should raw materials be drawn at greater cost of power and wear and tear in the former than in the latter? There is scarcely a miner in a civilised country who would attempt to draw the stuff from a level without wheels, either in a wagon or a barrow.

Mr. Ennor displayed very great mechanical ingenuity in raising the produce from the Delabole Slate Quarry; and he must agree with me that it would be a very great benefit were similar economy applied to all mining operations in Devon and Cornwall. Adventurers are perfectly right in endeavouring to prove the lodes as they proceed; but whether they drive or sink on the lodes, they would not be justified in allowing heavy costs for the mere extraction of the raw material in a slovenly manner over rough surfaces, when the ordinary mechanical appliances are at command, and would save at least one-half the amount. I wish Mr. Ennor's practical experience and mechanical ingenuity could be applied to these very desirable objects, so as to improve and reduce the great cost now attending mining explorations, especially in the majority of the mines in Cornwall and Devon.—Dec. 4.

EVAN HOPKINS.

MINING IN SPAIN—THE BEARIZ MINES.

Sir,—"Decomposed," I called the tin-bearing bands or lodes (if Mr. Ennor wishes it), because one of their principal components—felspar—occurs in a powdery decomposed form; even the harder portions, on being exposed to atmospheric action, soon fall to pieces, and become friable. The harder lodes are composed of quartz and mica principally, and I believe not only the "strange beings," but even Mr. Ennor himself, would find more than slight difficulties on attempting to work them with the "turnip hoe." I cannot answer the highly-speculative question of Mr. Ennor—whether those bands, &c., were formed at the Creation, or since; nor, in spite of many years' hard practical study in the field in more than one part of the world, have I ever come across a whole mass of primary rock growing; for such rocks are mostly composed of a variety of minerals, and the result of my observation is the opinion that within many such rocks or lodes certain individual minerals, or certain families of minerals, grow, crystallise, develop themselves, more or less, sometimes at the expense of others. Mr. Ennor, I am sure, must have noticed some of the many points of resemblance and dissimilarity, geologically and mineralogically speaking, which exist between the tin-bearing ground of this country (Spain), and that of other countries. Had Mr. Ennor seen any of the tin mines in our country, where the ore is so poor that only very great skill on the part of the "tanners," and a most carefully-arranged system, can make the mines yield a profit, I am sure he would not have attempted to sneer at those miners who cannot claim the honour of counting him (Mr. Ennor) as one of their countrymen.—Galicia, Nov. 25.

G. J. G.

MINING IN SCOTLAND.

Sir,—I fear the conversion of the Scotch land proprietors is neither so general or sincere as Mr. George Henwood expressed in his late paper (No. XII.) on "Mining in Scotland." In proof of this, I may mention one case in which the proprietor of an estate through which a copper lode is supposed to pass, but which has never been even proved, or attempted to be proved, modestly asked a dead rental of 1000. sterling annually, certain, whether copper be found or not; if found the hundred to merge, provided the dues (1-16th) were in excess. The estate comprises about 100 acres, is let at less than 1000. per year, the greater part being mere waste or moor land, only fit for depasturing sheep in summer, and capable of keeping about one sheep per acre. The place would require considerable outlay for roads, &c., the whole of which would be so much money laid out for the benefit of the proprietor and his tenant.

In another instance, where copper has been found, the proprietor not only declines to grant until he ascertains if he can work it himself to a profit, but absolutely refuses to give the poor miner who made the discovery a sovereign for his ingenuity and trouble. Under such conditions as these mining in Scotland may well languish, despite the efforts Mr. Henwood has made to write it up, and in spite of the great discoveries at the Lochwinnoch Consols, where the dues are only 1-16th.

Landholders may depend they stand in their own light, and thwart their own interest, by exacting high dues, and allowing their tenants to enforce vexatious opposition to the miner. Were such the case in Cornwall, the Lemons, Bassetts, Pendarves, and a host of other millionaires would have had to dwell as private gentlemen of limited incomes, instead of being amongst the most wealthy of even England's richest aristocracy. I hope this letter may be widely circulated amongst Scotch gentlemen, so that they may be induced to see the matter in its true light, and thus encourage the introduction of that siller of which they are so fond; for if they persevere in the obstinate and stupid course of endeavouring to grasp all, and to look upon miners as interlopers, they may depend upon it they will have ample opportunity of working their own mines themselves: capital will seek more genial climes, and more favourable circumstances. No sane person for himself, nor would any board of directors, be warranted in taking up sets under such preposterous circumstances as those first mentioned in this letter, as not only would ruin be entailed to the lessees, but the work they would execute would be expended entirely for the behoof of the next comer.—Nov. 30.

A FRIEND TO SCOTLAND.

MINING IN CARDIGANSHIRE—THE ABERNANT MINE.

Sir,—The Abernant Silver-Lead Mine lies to the west of the West Silver Bank Mine. The lode crops up to the surface full of ore, and it has been excavated by means of shafts and open cuttings for a length of upwards of 50 yards, and for the whole of this length the display of ore, both in the lode unbroken and broken, along the surface is quite extraordinary. It would have been a matter of surprise to me why this valuable mass of ore should have remained so long unworked if I were not aware of the nature of the lodes in this district and their deposits; but the explanation of the matter is this, the produce of this lode contains a hard rich ore, which it is difficult to deal with by means of the hammer, and must be dealt with by powerful crushing machinery in order to obtain its profits. I found this to be the case in Goginan, where, twenty years ago, from one bargain of six men, I have seen 30 tons of ore stuff broken in a day, which would require 150 girls a day to reduce by hammer or hand, which, at 1s. per day, would cost 75. 10s. Now, a good crushing-mill would reduce more than twice this amount for a cost of 12s. to 15s., labour and everything included, thus effecting a saving in one bargain of nearly 75. per day, or 1500. per month. At the time that Abernant and Goginan (the ores of which are very similar) were formerly worked there were no crushing-mills, and all the ore was crushed by hand labour; and by a calculation I entered into at the time I opened Goginan Mine, I found that although Goginan, by means of modern machinery, was realising a profit of 7000. per month, or upwards of 80000. per annum, if the work had to be done by hand the success would be quite reversed, and the mine would have been losing about 20,000. per annum.

At Abernant, as I have stated, the ore is abundant for a great length along the surface of the lode; and although it could not in ancient times be wrought at a profit, I calculate, from the number of shafts and ore bargains exposed to view along the surface, from which ore can immediately be broken in very large quantities, that if a good crushing-mill be erected it may easily be supplied with sufficient ore to return 20 tons of clean ore to the market per month, at a profit of something like 50. per ton; or, in other words, that the mine could immediately be made to give a profit of 12000. a year. I do not mean to say that it is not necessary to sink shafts and drive levels; this must be done as a matter of course, but the capital for the purpose and for erecting machinery bears but a very small proportion to the value of the mine in sight; and I have no doubt, and no person can reasonably entertain a doubt, but that the lower sections of the vein will be found greatly enriched with metal. The upper section at surface, however, is now full of very rich but hard ore, spread in ribs and branches, through a lode of which a division of 5 to 6 ft. in width is cut open to the day, and the ore stands up strong and bright in the daylight, open to the inspection of every and anybody. A good crushing-mill, which would begin to make profits at once, would cost about 2500., and an additional 10000. would lay open another working section of the mine, and ensure a handsome income and a permanent and very valuable mining property. It would, however, be wise, under limited liability, to raise a much larger capital than what is actually wanted, as the credit of mines under this law depends upon their having a large reserved fund, and I should advise 50000. to be provided for the purposes of the mine; and if my estimates are right, and I thoroughly believe them to be so, the company will immediately, as soon as a crushing-machine is erected, derive a profit of 25 per cent.

upon the outlay, which, from the experience of every mine in the district, will go on increasing at least for a quarter of a century; they have done so for a period of thirty years in the last working, which has been without intermission. I ordered the necessary crushing machinery on the ground; and if the engineering department continues in my hands, I undertake to deliver it to you a good paying property in three to four months from this time.—Aberystwith, Dec. 5.

MATTHEW FRANCIS.

NORTH HAFOD MINES.

Sir,—I have carefully inspected the North Hafod Mines, and find everything progressing in a very satisfactory manner. The section of the lode which cropped out to the surface, and which was so marked in its mineral character that we were induced to commence the engine-shaft upon it, has responded to the expectations we formed of it, by showing ore only a foot or two below the point where we were enabled to examine it when you last visited the mine. I was prepared to find ore in the lode, but not so near to the surface, and I take this as evidence that a great deposit of lead lies at no great distance under the present bottom of our engine-shaft, where the lead now sparkles throughout the formation of carbonate of lime. The symptoms we relied upon in this instance, and which have so far answered our best expectations, were a large formation of carbonate of lime, the prevailing colour of which was white, some opaque, and bearing the appearance of having been smoked, and a mass of black oxide of iron for a foot in width, soft, and re-looks of brown and red, which this mixture was smitten with various shades of the colours of brown and red, which I concluded were the chromates of lead, and which assisted in settling my opinion that there was a substantial and solid body of that metal crystallised in masses below. We endeavoured, as you were aware at first, to sink upon this out-cropping mass, which we took for the symbol of a good deposit and mine, and got over-burdened with water, but I allude to it and its characteristics so particularly, because in forming opinions as to the chances of opening good mines it is necessary that we should not only regard the data that guide us, but chronicle their chief features for the guidance of ourselves and others, so that they may serve for a beacon for good or for evil; if, for example, our enterprise turns out a good one, and we are enriched by it, it will form a landmark for encouragement in our future operations, but if it proves a false signal, we shall know how to avoid its allurement in time to come. So far every appearance strengthens the view that we at first formed, that we are opening upon an extensive lead formation. I informed you that we found the issue of water so great that we could not get down with the shaft, and we immediately prepared to meet the emergency by preparing for the erection of a water-wheel for pumping the water out of the works, the pumps and rods for which are now delivered on the mine; the mason-work for the water-wheel pit is completed, and the wheel is probably at this moment delivered on the mine, so that in a few days the wheel will be erected, and all the machinery be put together and completed for working. But while we were arranging this mechanical work we were not idle in the adit, the lode, and the shaft, but attempted to sink the shaft by cutting round it into the lode, and further eastward in the sides of the adit, and in this we were so far successful that we tapped the spring that carried the water into the shaft, and have brought it out through the adit by this means. We are now getting on well with sinking the engine-shaft on the lode without the pitwork for drainage, but which, no doubt, will soon be required, as we cannot hope to sink without it to any great depth. I am glad to be able to state that this has been so beneficial to us that we have got into a lode showing flashes of ore through the carbonate of lime, which was dense and solid, and devoid of lead, a few feet above; and although it is not solid enough for mercantile purposes, it is, to my mind, all that could be desired, and a sure indication that the whole mass is connected with an abundant supply of ore in the lower sections of the lode. We know we are sinking on the arms of the Great Frongoch lode, which have yielded thousands a year profit, and the value of which has been immensely increased by discoveries recently. I hear these discoveries consist of a lode in the whole rock, by the side of the Great Frongoch deposit, on the south, full of rich lead from the 80 to the adit. In our engine-shaft the part of the lode we are carrying is 7 feet wide, between two beautiful walls, bearing exactly the same underlie as the Frongoch lode, full of rich mineral indications, such as goossan and lime, and from which we are getting some beautiful specimens of lead ore; therefore, I think we shall soon be into a good mine here, and from my recollections of the surface section of the Frongoch vein, I shall be surprised if we do not find a similar mine, so that you need labour under no want of confidence in encouraging your friends to go on boldly with this enterprise.—Aberystwith, Nov. 30.

MATTHEW FRANCIS.

WEST SILVER BANK.

Sir,—I have just concluded my examination of this new and fortunate undertaking, which at first sight I found presenting larger rocks of ore, and of a more solid character than on my previous visits; and although I have heard that the envious have sought to depreciate the value of this discovery, it will be difficult for the most malicious to succeed in so doing. The quantity of ore contained in the upper section of the lode is of itself a sufficient guarantee of the nature of the ore ground below; and although I hear rumours about here that people are anxious to deny the merits of the mine, I know that their opinions will fall upon a deaf ear, as far as you are concerned; for, after you and so many gentlemen have had ocular demonstration of the yield of the lode, all such idle talk will only be regarded for as much as it is worth, which is the merest chaff. I am glad to inform you that the men, in cutting around the south side of the shaft for erecting a small shed over it for shelter for sinking it during the winter, have found large blocks of ore further north than where we are working, showing that the lode is much larger, and extends beyond what we at first took for the south wall. This is an encouraging feature, when the shaft and the other openings will be carried on with rapidity and regularity. I am very glad to say that the water in the upper crust of the lode, which is running through the side of a steep hill, offers no difficulty as yet to sinking, and by the time it increases so as in any way to obstruct our progress, the machinery will be ready for draining it. My opinion is that this mine will be opened on one of the best ore deposits in Cardiganshire, and that it will be a source of great and constant profits to the company.—Aberystwith, Dec. 1.

MATTHEW FRANCIS.

THE SLATE TRADE.

Sir,—I am pleased to observe that the public are at length becoming alive to the great value of slate companies as investments, for I feel certain nothing can be more profitable at the present time than a well-selected slate quarry, under judicious management. Caution, however, should be used, and rigid enquiries instituted in proper quarters, before shares are taken in any of the slate companies that are now being so continually brought out, as some of these schemes are utterly worthless, the "so-called quarries" having little, if any, slate in them. Other quarries, though abounding in slate of good quality, are so remotely situated from a port, and require so much expensive machinery, that the expense of raising and getting the mineral to market would swallow up the greater part of the profits. I could without difficulty class most of the recently introduced quarries, but will content myself with mentioning at present two of the most promising—the Moelwyn and the Glyn-y-Pwll, both well situated in Merionethshire, on the Festiniog veins of slate. The Moelwyn (I rather think it is styled the Great Moelwyn) has abundance of good slate, and is being most vigorously worked, and in two years' time, with a judicious expenditure of the large capital, ought to be made to pay most handsomely. An incline from the quarry to the Port Madoc Railway, a distance of, I should say, 1600 yards, will be laid down in the spring. This company, I think, may be very safely recommended to intending investors. As to the other—Glyn-y-Pwll Quarry,—I fairly confess I am enchanted with it. Its admirable situation, the facilities for working it, the immense amount of first-rate slate it contains, all point it out as certain to prove largely remunerative to its fortunate proprietors at a comparatively early period. Nothing can be more judicious than the plan adopted in working this property by its talented manager; and the London board consists for the most part, if not wholly, of shrewd business-like men (I have the pleasure to know four of them thoroughly), who will most assuredly study the shareholders' interests in every possible manner. I feel justified in asserting that the Glyn-y-Pwll Slate Company will be in the Dividend List by the end of next year, and that in a very few years it will equal in wealth the famous quarry belonging to Lord Palmerston, which is in its immediate proximity, and on the identical seam of slate. Glyn-y-Pwll Quarry is, in fact, one of the most promising—if not the most promising—slate concerns that has ever been offered to the public.—Dec. 2.

JENKIN REES.

WHEAL FLORENCE.

Sir,—This mine is situated in the parish of Fernaneth, near Marazion, adjoining the west of Wheal Grylls, through which the Wheal Grylls lode runs, the eastern boundary of Wheal Florence being the western boundary of Wheal Grylls. It is an extensive set, the property of Mr. W. J. Trevelyan, and is granted by him to the present company of adventurers for 21 years, from June 26 last, at 1-18th dues, and named by him after a member of his family. In the last four months, since the commencement of our operations, we have raised above the 30 ft. level 12 tons of tin, which has paid for all the requisite machinery, and will leave a clear profit on the four months' working of about 2000. and 3000. The tinstuff is stamped and returned at Leeds and St. Aubyn, an adjacent mine, where a satisfactory arrangement has been entered into with the shareholders for renting eight spare beds of their powerful steam-stamps, which we are now keeping fully at work day and night. The stamps, floors, buddies, frames, &c., we have laid out and paid for, being our own property, and which are in an efficient state for returning any reasonable quantity of tin. The 30 ft. level, at present our deepest workings in tin ground, is taken up from Wheal Grylls boundary, on their standard lode, and in driving west we have to-day met with Fisher's lode, on which their engine is erected. The men brought up some good mass of tin from the lode, but they will require a day or two to cut through and open on it before I shall be able to report on its value. Georgia Lode: Wheal Florence boundary, on the south, is within 40 fms. of Georgia shaft, on which Wheal Grylls adventurers are in course of erecting a steam-stamp and pumping-engine, and within 30 fms. of their recently-discovered rich course of tin. We have four men driving the deep adit (40 fms. from surface) north of boundary shaft, on Georgia lode, which will soon intersect the other lodes in Wheal Grylls set; also Hosking's and Grylls lodes, which in St. Aubyn and Grylls Mine have yielded large

quantities of rich copper. Should our present ground continue in the deep adit, which we are driving at a cost of 40s. per fathom, within three months we shall cut all the lodes above mentioned, and drain them effectually 10 fms. below our present deepest workings; and, as a large proportion of the mineral wealth of Wheal Grylls and this district has been found above the level of our deep adit, I may venture to affirm that I know of no mine in the county that presents such prospects as Wheal Florence does; it being one of the rare instances in which a Cornish mine has been brought to a profitable and sound state of working without any call being made on the adventurers. We raised last month 4 tons of tin, out of which we sampled some tinstuff from the north part of this valuable set, which produced 72 dwts. The profit on the month's working will be about 1000.—Dec. 3.

JOHN CURTIS, Underground Managing Agent.

DALE MINE.

Sir,—The remarks of "A Shareholder," in last week's Journal, in reference to this mine, so far as Mr. Niness is concerned, are perfectly correct. Had his advice been acted upon by the directors the mine would have been on the eve of paying dividends; as it is, both time and patience will be required ere that desire be accomplished. The present depth of the Pipe is about 30 fms. from surface, so that it is evident, at the present rate of sinking, something like fifteen to eighteen months will be gone ere the shaft be down to the Pipe. Why do not the directors take advantage of Mr. Crease's machine, by which he will undertake to sink 2 fms. in three days? This is exactly the thing wanted at Dale; the shareholders would then have their shaft down in something like four months, and their shares four times their present value. I believe Mr. Niness has called the attention of the secretary to this machine, but whether the directors have had it under their consideration I am not aware; my opinion is the subject is well within their attention. There is another source of profit which the shareholders ought to look after—the lime-kilns. Although the subject has on two occasions been brought before the shareholders, yet nothing practically is done. The shareholders are told why, nor can I see any reason why; the kilns are there, the limestone is there, and the demand for the lime when burnt is there. I, as a shareholder, should like to know the why and the wherefore of the delay. If the directors do not feel disposed to work them, I, for one, should be glad to take them off their hands at a reasonable rent, and would have them at work the next burning season. There is an excellent market for the lime, and a profit from that would, I have no doubt, be as acceptable to the shareholders as a profit from lead. Let the shareholders bestir themselves upon this point, as I can assure them there is a good profit to be realised from that source alone, especially now, as the Blith Colliery will soon be at work, which will be able to supply coal at two-thirds the present price, it being within a few miles from the kilns. J. STEES.

Leek, Dec. 4.

GRAMBLER AND ST. AUBYN MINE.

Sir,—In driving the 12 ft. level south we have cut the horse-engine lode, which is 15 in. to 16 in. wide, of very good ore. The lode has also improved in the pump-shaft. No particular alteration in any other part of the mine. WM. RICHARDS.

Redruth, Dec. 5.

WHEAL SETON.

Sir,—In consequence of so many disparaging reports respecting this mine, will you kindly insert the following in your valuable Journal of Saturday next:—In the 140, east of Tilly, on the north counter, the lode is 7 ft. wide, producing 7 tons of ore to the fathom; in the 140 west, on ditto, 4 tons; in the 140, west of junction, east of Tilly, 3½ tons; in the 140, east of Tilly, on new south lode, 5 tons to the fathom; in the 140 west, on ditto, 3½ tons, and still improving; in the 130, west of junction, east of Tilly, the lode is 4½ ft. wide, producing 2½ tons of ore to the fathom, with every indication of a further improvement. In the bottom of the 130, about 8 fms. to the south, on the 140, on the north counter, a vein is sunk 5 feet to the 130, 3 ft. wide, producing 6 tons of ore to the fathom, works from 132 to 137, per ton; in consequence of so much water, is suspended for the time, but hope the same will be shortly drained by the level below. A sudden failure has taken place in the 70, west of Bull's, on the south lode; lode split for the last 2 fms., but as the two parts are now together again we are under full expectations of an improvement at this point. In the 100, west of Tilly, on north counter, the lode is worth 6 tons of ore to the fathom. If the adventurers will have a little patience in opening up a level or two below the present bottom, which is being done with all possible vigour, we believe Wheal Seton will again become a large and profitable mine.—Dec. 4.

ROBT. WILLIAMS; WM. HOWE.

MINING IN SCOTLAND.

Sir,—As to enquiries made by your correspondent, "Scotia," in last week's Journal in reference to the Erins Copper Mining Company, I beg to give you the following information:—This company consists of 1000 shares of 50. each (10. per share on allotment), which were all taken up in one day, and this, too, without being made public by either prospectus or advertisement. The mines were examined by no less than five first-class mining engineers, who all spoke in the highest terms of it; one of them visited the celebrated mines in Cuba, and in his report stated these mines were equal, if not superior, to them. Samples of the ores have been assayed by Messrs. Ritchie and Mitchell, of London, and Prof. Penny, of Glasgow, and found to contain from 14½ to 32½ per cent. of copper; and even some of the undressed ore was found to produce as high as 42 per cent. There is about 60 tons of dressed ore ready for the market, and upwards of 100 tons undressed. The report from the mines to-day is of the most favourable character. I hope this will satisfy your enquiring correspondent. Glasgow, Dec. 4.

A SHAREHOLDER.

SORTRIDGE CONSOLS—PRACTICAL MINING.

Sir,—I observe a general meeting of shareholders is appointed to be held next week. As a shareholder, who will, unfortunately, be unable to attend, I take the liberty of mentioning some topics which I trust may come under discussion. First, as to the reason why the driving on the 110 ft. level east has been abandoned. I do not profess to be a practical miner; but seeing that every level below the 60 has proved unproductive down to the 95, where the lode improved, and, according to Capt. Richards's report for the meeting held in November, 1860, was worth 1½ tons per fathom for 14 fms. in length, it does seem to me unaccountable why the driving of the 110 should be suspended when it has reached within a few fathoms of the productive ground in the level above. At first sight, it would seem the favourable report was made to deceive the shareholders, but the high character of Capt. Richards forbids such a supposition for an instant; and, besides, the weekly reports from the mine corroborate the statement, and only make it appear the more extraordinary that, after sinking 60 fms. through unproductive ground, the point should be abandoned just as success seemed certain. Another important point at this depth is the south part of the main lode, which has probably formed a junction with No. 1 south lode, as they underlie towards each other. As I said before, I am a miner; but seeing that the south part of the lode existed at so short a distance from the main portion, it appears to me strange that the course of ore now being worked upon was not discovered before. It might have been tested very inexpensively by cross-cutting (a principle you so often recommend); and it is doubtful whether it would ever have been met with at all, but for the cross-cuts extended in North Robert. In Capt. Richards's report for the last general meeting, he stated that if the committee approved, a cross-cut would be put out towards the great north tin lode, as recommended by Mr. Nicholas Ennor. From such a cross-cut not being mentioned in the weekly reports, the shareholders are left to assume that the committee object to it; on what ground it is difficult to say, as there is every chance of the expense being met by the returns from the present workings. In North Robert, we are told, there is a productive tin lode being driven upon in the direction of Sortridge, and not far from the boundary. If any attempt is being made to see the same lode in this mine, the shareholders are not informed of it. In the 40 and 50 ft. levels west the lode was in a highly favourable stratum, and for a short distance before reaching the cross-course was worth 500. per fathom. Nothing has been done to prove the north and south parts of the lode at this point. As the returns from the mine are likely to exceed the costs for some time to come, it strikes me that now is the time to attempt further discoveries. Should the points above-named be deemed unworthy a trial, I trust the shareholders will excuse my calling attention to them, and attribute my mentioning them to well meaning. Dec. 5.

THE ST. JUST UNITED MINES.

Sir,—I was highly gratified last week to see by the Mining Journal that the St. Just Mines were likely to be set to work again. Permit an old miner to say a word in his plain way about this property. I well recollect when this mine was looked upon as the best in Cornwall; it gave employment to more men than all the mines in the district, and had it not been for the great fall in tin, and the want of a better power to unwater the mine, it would have produced enormous returns; but circumstances seem to have decreed that this treasure should be left for a future generation. It has been the surprise of all I have known in the district that these mines have laid so long unworked. I have heard special reasons for this, but it has certainly not been for the want of applicants; however, I am rejoiced to find they are now in a fair way to be re-opened, and I am confident of this, that with all the advantages the mining interest possess at the present day in steam-power, improved machinery, practical skill, and the high price of tin and copper, these mines in a short time will rank in public estimation, and give large returns and profits to the shareholders. My poor father, who knew these mines well, I have frequently heard say the time was sure to come when they would be worked again. What is 42 fms. in depth? This mine may be sunk 300 fms., and as the tin is rich, the miners will have no doubt as to its holding down, and I am satisfied in the first start of this mine the adventurers will be encouraged and gratified by handsome returns from the old levels as soon as the water is in fork; but when the sinking operations are in progress, it is then that the riches will be unfolded. And I will mention another point my poor father used to talk of—that he had seen a fine copper lode in the western part of the mine in the decomposed granite and in the killas, running under the sea, which he felt sure would turn out a valuable discovery. I must ask your pardon, Sir, for intruding so much on your patience, but I was so much delighted when my poor father said this project—it brought to my recollection so much of what I had heard my poor father say, when at our fireside on winter evenings—that I could not resist the opportunity of telling what I knew of St. Just tin mines; and as I have taken a small interest in it for old acquaintance sake, I shall continue to feel an interest in its success, without the slightest doubt as to the results.—Near Marazion, Dec. 2.

A. RICHARDS.

THE INVENTORS' ALMANAC.—The fourth annual issue of this almanac, published by Mr. M. Henry, the patent agent, has just made its appearance. As upon the first introduction of the almanac to the public the intention was expressed of each year adding to the information given, it will not be surprising that we have again to allude to a further accumulation of valuable data. We last year mentioned Mr. Henry's statistics of patents, showing the number applied for and granted during a long series of years, and giving an analysis of the subjects of the patents applied for during the preceding twelve months. In the edition for 1862, not only have these particulars been continued, but a new and highly interesting feature has been introduced—the applications are classified according to the residence of the inventor, so that the inventive genius of different localities can be readily judged of.

THE LADY'S ILLUSTRATED ALMANAC.—This cheap and elegant little annual is already well known to our fair ones, and the edition for 1862 is now placed at their disposal. It contains the usual amount of almanac matters, as well as many toilet recipes; hints for the flower-garden and kitchen garden, work-table patterns, and other particulars peculiarly interesting to ladies, including well-written tales, beautiful poetical scraps, and a large number of beautifully printed engravings of sculpture, landscapes, and botanical subjects.

MASONIC ANNUAL.—The edition of the Freemasons' Calendar and Pocket-book for the ensuing year has just been issued, and we cannot say more to recommend it than that it is fully equal to the editions which have preceded it. As the fraternity generally are aware, the Pocket-book combines the advantages of a calendar, a parliamentary and a lodge directory; its contents, in fact, a vast amount of masonic information in addition to the usual contents of a gentleman's ordinary pocket-book. To secure an extended circulation for the book it will be only necessary to remind the craft that it is published for the benefit of the Charity Fund, under the sanction of the Grand Lodge, and by command of the M. W. Grand Master.

BRITISH MINES.

HOLLOWAY'S PILLS AND OINTMENT—SUDDEN CHANGES.—Changes of temperature constantly occurring during the winter are prone to produce rheumatism, neuralgia, and other painful disorders of the nerves and muscles. For upwards of 20 years Holloway's remedies have been particularly successful in curing this class of complaints. The parts, previously fomented in warm water, have only to be rubbed twice a day with this soothing ointment to be relieved from all pain; by still persevering the swelling is reduced, and freedom of action perfectly restored, when the afflicter ceases to trouble. Holloway's remedies relieve likewise gout, spinal affections, weakness of the limbs, glandular enlargements, and all scrofulous swellings. Holloway's excellent pills and ointment thoroughly purify, heal, and strengthen.

4 ft. wide, will produce $1\frac{1}{2}$ cwt. of tin per 100 sacks.

but not sufficient to mine, it is letting out water freely, and shows kindly indications for improvement. The ground in the 60 north is easier for driving, but unproductive at present. The cross-cut east from the 60 north has passed through a small branch, containing blende, and is expected to reach the east lode shortly. All other parts of the mine are without alteration worthy of notice since last report.

The 130, the lode is 18 inches wide, composed of mundic and spar. The lode in the 100 is 16 in. wide, composed of flookan and spar. In the 120 west the lode is 1 ft. wide, composed of spar and good stones of ore. We have been obliged to stop the winze in the bottom of the above named level, in consequence of an increase of water. The two stops in back of the 120 west each yield 3 tons of ore per fm. The lode in the 110 west is 20 in. wide, yielding 2½ tons of ore per fm. In the 100 west the lode yields 1 ton of ore

8 ft. wide; the south part of it, on which we are driving, contains iron, mundaic, some stones of yellow copper ore, and a little tin, but upon the whole is of no value; the lod in the western end is same level is about 2½ ft. wide, well formed, and produces a little tin, but not to value. The lod in the 60 east, as also in the eastern end of the stone behind the end, is improving in width; the quality of it is about the same.

VALE OF TOWY.—A. Waters, T. Harvey, Dec. 4: In the engine-shaft, stokin below the 100, the ground is not quite so favourable for progress as it has been of late.

is 40 fms. deep; it was worked from surface to the 23 for a few fathoms in length; from the 23 to the 33 it was worth for 11 fms. long 30¢. per fm. In the 40 (or adlt level), which is only driven 20 fms. on the lode, it was in some parts much better; and the

WHEAL SIDNEY.--W. EDWARDS, Dec. 5: We are now in about 11 feet on the south or main lode in the end of the 60 cross-cut; the progress during the last fortnight, as

also at present, having been much retarded by the strong influx of water, and the porous character of the lode, the quality of which has varied, being latterly not so rich as last reported; but I am still of opinion that an improvement may be fairly looked for as we approach the south wall. In a winze sinking immediately above, in bottom of the 46, west of diagonal shaft, we are about 8 feet, the lode very large, giving some very rich work for tin, and altogether of a most splendid character. This work will be pushed on with the utmost possible dispatch to meet the notice which will be put up from the 60. In other parts of the mine there is no change to notice.

WHEAL UNION.—Thos. Glanville, Dec. 4: In the 46, driving east of Moyle's shaft, the Turnpike lode is 6 ft. wide, producing about 15 tons of tin ore per fathom, worth by assay 31. 10s. per ton; we are again sinking Moyle's shaft, to see the lode at a deeper level. The other parts of the mine are progressing favourably.

WHEAL UNITY CONSOLS.—Wm. H. Reynolds, Nov. 30: We have seen a little more of the lode in the 50 ft. level cross-cut since writing yesterday; it is now from 2½ to 3 ft. wide, composed of soft spar, iron, prill, and muddle, with rich grey and peacock copper ore through it. We believe that as soon as we are free from the cross-course, with which it is at present mixed up, we shall find it a good lode; at all events it is now a large strong lode, and its composition and general character is all that can be desired. We have just touched something in the 75 ft. level cross-cut, which we shall cut into on Monday, and we think it likely to be the lode.

Wm. H. Reynolds, Dec. 4: In the 55 east the lode yields good stones of ore, and is improving. In the 75 cross-cut north we have cut into the lode 2 ft., but are not yet through it; it is made up of soft spar, prill, iron, and muddle, and letting out a large quantity of water. We believe that it will improve as soon as we get off from the cross-course, with which it is at present mixed up. The lode cut in the 50 is 2½ ft. wide, with a little rich ore through it, and improving going west. Other parts as last reported.

YARNER.—R. Barkell, Dec. 4: The lode in the 40 west is better defined, and is producing good saving work. We are dressing some of the stuff, and find it to be turning out equal to our expectations. The 40 east is poor. We think the main part of the lode is standing in the side, and in the 40 west at a cross-cut to prove it. The 30 west is worth about 2 tons per fathom; lode large and wet, ground easy for driving. The slope is yielding 4 tons per fathom; the lode here for the past few days has been disordered by a horse of killas, but is again wearing out. There is no other alteration.

MINING NOTABILIA.

[EXTRACTS FROM OUR CORRESPONDENCE.]

NORTH WHEAL EXMOUTH.—Having seen a sale advertised a short time since and adjourned, and that since steps have been taken for winding-up by liquidators, I should be glad if the purser, secretary, or committee would state through the Journal, for the information of distant shareholders, what the meaning of this is; and also explain the financial position of the mine, and what became of all the money subscribed when the mine was commenced—surely it cannot be all spent.—[From the resolutions passed at the meeting referred to in last week's Journal, it appears that the company's affairs have been thrown into Chancery, and that the executive are endeavouring to avoid needless litigation, by adopting a course which will satisfy all concerned, and render further proceedings unnecessary.]

EAST CARN BREA.—A telegram has just been received, which states that a good lode has been cut during the week. It is now 2 ft. wide, and the wall not yet reached—worth 60s. per ton. The mine throughout has generally improved.

WHEAL EDWARD.—Within another week something good is expected to be cut. The sales of ore, instead of 250 tons, as stated at the meeting, will be 275 tons, and the next sale more. I should strongly advise the committee not in future to allow surveying agents to inspect on the sampling-day, when Captain East is at the quays sampling. It is not justice to the agent, to the adventurers, or to the public. It is reported that one inspecting agent, who visited the mine on Friday last, has admitted that through smoke of powder he could not see some important points. Surely it is high time to stop such proceedings, which are merely got up for share jobbing purposes.

LADY BERTHA.—This is one of the mines in which the advantage of having a secretary unconnected with shareholding would be apparent. A secretary getting the first report from the agent, and dealing in the market, has several days' advantage over the general body of shareholders. The sooner a change from this system of managing mines is made the better for the well-being both of mines and mining.

ROSEWARNE CONSOLS.—We have had an excellent lode of copper ore, for 3½ fms., in the 30 ft. level east, and think we have it now coming in in the 40 ft. level. The mine is looking well.

WHEAL GRYLLE.—During the week this mine has improved in three or four places, and the new lode, referred to last week, continues to look well, worth full 10s. to 15s. per fm.; driving at 35s. per fm. This discovery is all in new ground to the face, 40 fms. high and dry, and for an immense length, which will take years to exhaust. In driving a few more fathoms a rich deposit of tin is likely to be met with, which will greatly add to the value of the mine. At Annie's engine-shaft sinking has been resumed on a fine lode, 6 ft. wide, worth 18s. to 20s. per fm., and is improving. In the 20 and the lode is worth 6s. per fm.; winze below, 6s. per fm. In the 20, west of flat-rod shaft, the lode has improved, worth 7s. to 10s. per fm., and the end east, which was not to value, is now worth about 5s. to 7s. per fm., and adit south 10s. per fathom. All these ends are driving in easy ground. The two stoops on Georgia are worth 35s. per fm. The engine-house is up and covered in, and it is hoped the engineers will be able to start the working of the engine before the end of this month. An inspecting agent writes this week as follows:—"I can see no reason why you should not be able to sample full 20 tons of tin per month, if the stamps go to work early in January. Should Georgia lode be found as productive below the adit as in the stoops above the adit, there will be no difficulty in making an increase in the samplings, and it is highly probable you will make a good discovery in Georgia part of the mine, as the shaft is sunk. Should this be the case, the mine cannot fail to make large profits and handsome dividends. It will require a little extra time and outlay to make floors, &c. I should say 500s. to 600s. per month would be a very good profit, and about a fair estimate. The agents at the mine are the best judges as to what tin can be raised monthly, and as you have always found them within the estimate, you may rely on it they will do their best. I am of opinion they can see their way clear to sample more than 20 tons of tin per month, and make profits of 500s. or 600s. per month." This would be at the rate of 6s. per share profit per annum, or (say) 6000s. The shares in this mine, although they have fallen from 18s. to 15s., without any cause, will soon see double this figure.

AT ROSEWALL AND RANSOM UNITED a rich carbona has been cut.

GREAT CRINNIS.—Some of the copper ore and stones from the lode in the 100 west have been received at the office. The ore is rich yellow sulphure, and the matrix has been much admired by competent persons. There is every reason to believe that this 100 ft. level is near a large deposit of ore.

KESWICK MINE.—The lode in the 20 is still a magnificent course of lead. The lead is of the purest character, a leader more than 1 foot wide is solid lead, and the other part of the lode is producing excellent lead, but not as pure as the leader named. Should this continue, this persevering company will be amply rewarded.

AT EAST PROVIDENCE operations are going on satisfactorily and well, and opening out good tin ground. When the winze is holed to the 30 ft. level returns will greatly increase.

GREAT TREVEDDIE.—Capt. Polglase (Dec. 4) reports—"We have a splendid lode of tin in the counter, and the east and west lode looking well too."

WHEAL BASSET has improved at several points.

CUDDRA.—The tin part of the lode in the 100 fathom level, west of Tickell's, has been reached and cut into 1 foot, which is producing some splendid work for tin. This is an important discovery, as this level is 40 fms. deeper than the present works at Walker's, and 90 fathoms further east. It is considered this is the same run of tin ground as that at Walker's shaft. There is every prospect of having a lasting and productive property.

SOUTH DARREN.—This mine continues to open out extremely well. The 50 east is worth 12 cwt. per fathom, the 80 west 10 cwt., and the 70 east 1 ton per fathom; the last-named level being about 80 fathoms ahead of the 70, and has passed through a productive lode nearly the whole length, increasing considerably in value in going east. There are winzes being sunk below the 60 and the 70, which will shortly be completed, and enable the returns to be increased and the driving of the 60 (worth 6 cwt.) to be resumed. There are 24 men working on tribute, at from 7s. to 11s. per ton, including all cost, and other pitches are about to be set. The price of the ore even at present is about 18s. per ton. Regular monthly sales are made, which meet a large proportion of the costs, and there is scarcely a doubt but that good profits will soon result.

NANTEOS AND PENRHUW.—According to the report of Capt. Roach, presented to the meeting last week, the ore ground laid open is estimated at 7000s.; and he remarks that "with the ore already discovered, a small discovery in new ground, would enable the proprietary to get dividends." A good bunch of ore was discovered on the north lode, in the deep adit, at Eystuntan, which has held up well in the upper levels, and at 5 fathoms under the adit the lode was cut into, and found worth 2 tons of lead ore per fathom. The shaft is down to the 10, under adit (about 70 fathoms from surface), and Capt. Roach states that he has "great confidence in good bunches of ore being discovered by extending the level west on the north part of the lode." He also says that there is "an immense quantity of virgin ground to drive into, and the discovery of a good deposit of ore, which is likely to occur in this direction, would enhance the value of the property fivefold;" and also that "there is an immense quantity of lode unexplored in the upper levels, which, no doubt, will be found equal in quality to that already open for working." The agents (Captains Boudry and Paul) remark that the mines "were never in a more efficient state of working than at present, and the prospects never better." A number of tribute pitches are about to be set at 4s. 10s. to 6s. per ton, including all costs. We may say, therefore, that the prospects of these mines are very good, and there are few in which the shares can just now be purchased so exceedingly cheap. We understand that the late large shipments of lead to America have exhausted the stocks, and looking also at the otherwise increased demand, a rapid rise in price is expected.

LOCHWINNOCH CONSOLS.—A reference to the Swansea Ticketing Paper of last week will show that these mines sold 77 tons of copper ore, at 5s. 6s. 6d. per ton, and 14 tons at 9s. 4s. 6d.—a pretty good proof of the increasing value and quality of these mines' produce. A cargo of 85 tons is now at Swansea awaiting sampling, on the mine are many tons ready to be shipped off, and between 60 and 80 tons broken underground ready for the slight process this ore requires and receives. In a short time the returns may be doubled. At the close of the year I will send you a return of all the ore raised and sold from the commencement. Ore was first cut on March 11 of the present year.

WEST KAIME MINE sells 16 tons at Swansea the next ticketing. On Monday next a further consignment of about 20 tons will be made for November month. The severity of the weather has materially interfered with surface operations.

CALDER GLEN UNITED MINES.—Capt. Bailey, of Tavistock, has been appointed to these mines, at a salary of 12s. per month, and will enter on his duties immediately. The extremely wet weather of last week has been much felt, causing great inconvenience. The River Calder was on Friday swollen to an unusual degree. Some members of the board of directors and the collector to the company were placed in a very awkward position, if not in jeopardy. After the board meeting, in going from Lochwinnoch to the railway station, in Mr. Watkins's omnibus, the road was so flooded that the gentlemen were driven into the water suddenly to such an extent as to render a return necessary. It was with difficulty that Mr. Watkins extricated them all safely. It was well that he was with the vehicle, being a very powerful man, for, although standing 6 ft. high, the water reached his breast. The party, after changing their wet garments, proceeded homewards by way of other dangers, fortunately without other damage than an unpleasant bath. It is much to the discomfiture of the authorities that the road should be allowed to remain in so dangerous a state as at present, when it can be so easily remedied. Every winter the floods render this place impassable to foot passengers, except at great personal danger and inconvenience.

AT WEST SHARP TOR the prospects are very much improved. Morris's engine-shaft has been sunk and made complete to the 162, and 2 fathoms driven east on the north side of the lode. At this point the cross-cut was commenced, and has been extended into the lode about 7 feet 6 inches. The first 6 feet is in hard capel, similar to that found in connection with fine courses of ore in this locality; inside this

capel soft gossan has been found, as well as iron, congealed quartz, prill, and a little grey copper ore. A course of ore is expected as this part of the lode is opened out. The machinery is in good order, and adequate to the requirements of the mine. Capt. W. Richards estimates the cost to carry out the operations in hand at 230s. per month.

WEST WHEAL LOVELL continues to excite unusual attention in the locality and surrounding neighbourhood of Helston. From the fact that pumping operations only commenced in February last, and the discoveries made in the bottom of the mine (both east and west) since, warrant the shareholders in the belief that a rich mine will soon be opened out to them. Both ends are producing a fair quantity of rich lead ore. There are two shafts being sunk below the 10 fathom level, and the ground is highly congenial for the production of lead ore. The several agents who have inspected this property are unanimous in their opinion as to the ultimate value of the undertaking. The sett, which is very large, embraces several known rich copper and also tin lodes, which is a very great advantage, and enables me to state that West Wheal Lovell will prove a prize for the year 1862.

BULLER AND BASSET.—The lode in the 80 west is 4 feet wide, very kindly, and is producing rich stones of ore. The lode in the 60 west is of the most kindly character, and producing some good strong copper ore. The ends are very promising, and from the strength and character of the lode, an improvement is expected.

CUDDRA.—An important discovery has been made in the 100 west at Tickell's shaft. After driving across a mass of fine gossan for near 4 fathoms in width, the tin part of the lode has been reached; it is cut into 1 foot, and is producing splendid work for tin. This run of tin ground is supposed to be the same as that at Walker's shaft, as it is identical in character. This discovery is 90 fathoms east of Walker's shaft, in which there is a great course of tin. The agents consider this to be the same run of tin ground, which would be upwards of 90 fathoms long, and 40 fathoms deeper than the 60 ft. level. This discovery is of the greatest importance to the company, and will place the success of the undertaking beyond a doubt. The lode in Walker's shaft has not been taken down during the week; when last taken down it was worth 7 cwt. 1 qr. 21 lbs. per 100 sacks, and is left equally good. It will be taken down again in the course of the week.

The Mining Market; Prices of Metals, Ores, &c.

METAL MARKET—LONDON, December 6, 1861.

COPPER.		BRASS.	
Best selected.....	110 10 0	Sheets.....	10d.-11d.
Tough cake.....	107 10 0	Wire.....	10½d.-11d.
Tile.....	107 10 0	Tubes.....	10½d.-11½d.
Burra Burra.....	104 0 0 (Nom.)	FOREIGN STEEL.	
Coplaso.....	98 0 0-100 0 0	Swedish, in kegs (rolled) 15	0 0-
Copper wire.....	0 1 2	" (hammered).....	15 10 0-16 0 0
ditto tubes.....	0 1 2	ditto in faggots.....	16 0 0-17 0 0
Sheathing & bolt.....	0 1 0	English, Spring.....	18 0 0-23 0 0
Bottoms.....	0 1 1	Bessemer's, Engineers Tool 44	0 0-
Old (Exchange).....	0 0 10½	" Spindle.....	30 0 0
IRON.		QUICKSILVER.....	7 0 0 bottle
Bars, Welsh, in London.....	6 5 0	SPELTER.	
ditto, to arrive.....	6 0 0	Foreign.....	18 0 0
Nail rods.....	7 0 0	To arrive.....	18 5 0 (Nom.)
" Stafford, in London.....	7 0 0-7 10 0	ZINC.	
Bars ditto.....	7 5 0-8 0 0	In sheets.....	24 0 0-
Hoops ditto.....	8 10 0-9 0 0	TIN.	
Sheets, single.....	9 0 0-9 10 0	English, blocks.....	120 0 0 (Nom.)
Pig, No. 1, in Wales.....	3 0 0-4 0 0	ditto, Bars (in barrels).....	121 0 0-
Refined metal, ditto.....	4 0 0-5 0 0	ditto, Refined.....	122 0 0-
Bars, common, ditto.....	5 0 0-	Banca.....	121 0 0-122 0 0
ditto, in Penryn.....	10 0 0-	Straits.....	118 0 0-120 0 0
ditto, railway, in Wales.....	5 0 0-	TIN-PLATES.	
ditto, Swed., in London.....	11 10 0-12 0 0	IX Charcoal, 1st qua. p. bx. 1	8 0 0-1 9 0
To arrive.....	12 0 0-	IX Ditto 1st quality.....	1 14 0-1 15 0
Pig, No. 1, in Clyde.....	2 8 0-2 18 0	IX Ditto 2d quality.....	1 4 6-1 6 6
ditto, f.o.b. in Tees.....	-	IX Ditto 3d quality.....	1 11 0-1 13 0
ditto, f.o.b. in Tees.....	-	IX Coke.....	1 2 0-1 2 6
Staffordshire Forge Pig.....	3 10 0-3 12 6	IX Ditto.....	1 8 0-1 8 6
Welsh Forge Pig.....	-	Canada plates.....	12 10 0-13 0 0
LEAD.		In London; 20s. less at the works.	-
English Pig.....	20 0 0-21 0 0	Yellow Metal Sheathing.....	p. lb. 10d.
ditto sheet.....	21 0 0-	Indian Charcoal Pigs.....	6 12 6-6 15 0
ditto red lead.....	22 10 0-	In London.....	-
ditto white.....	28 10 0-30 0 0	At the works, 1s. to 1s. 6d. per box less.	
ditto patent shot.....	29 10 0-30 0 0		
Spanish.....	19 10 0-19 15 0		

REMARKS.—The serious aspect of American affairs has caused considerable stagnation in our market, all business during the week being comparatively at a standstill. This is, however, only the temporary effect of the existing uncertainty, and whichever way the present difficulty may be decided, our trade will again, doubtless, flow on in its wonted channels, but at present buyers suspend operations, and sellers have not yet shown any inclination to unduly press sales, except in the cases of a few timid or weak holders, who have realised, of course, at some sacrifice; the majority, however, prefer to stand quietly aloof for a time, until the issue of the momentous question—"peace or war"—is definitely known. Even should the reply be so unfavourable as to lead to hostilities between this country and the Northern States of America, there is but little reason to fear that the metal trade would be very injuriously affected, as the passing of the Morrill Tariff has almost entirely prevented exports of metals thither, by rendering the duties nearly prohibitive, and, therefore, little or no further loss of trade can be incurred in that quarter; but, on the contrary, we should have the southern ports of America open to commerce, which in itself would make ample amends for the loss of the extremely limited trade that is now carried on with the North. With regard to the demand for India and other parts, there will probably be no diminution. The continued easiness of our money market will assist holders in maintaining with steadiness the present position of metals.

The foregoing remarks apply with but little variation to all the metals, a very short summary of each, therefore, will suffice.

COPPER.—English continues quiet; there are, however, some second-hand parcels in the market offering under fixed rates. Foreign quiet—quotations nominal. Burra Burra, 104s.; Kapunda, 106s.; Spanish, 93s.; Chili, 93s.; Baltimore, 91s.

IRON.—The price for railway bars has slightly receded, present quotations being 5s. to 5s. 2s. 6d., f.o.b. at the works. Merchant bars in fair request at 5s. 2s. 6d. to 5s. 5s. in Wales. Staffordshire descriptions slow of sale, and rather easier in price. Swedish bars remain firm, with an upward tendency in price. The arrivals in consequence of the scarcity of vessels and high rate of freights ruling in Sweden are very limited, and soon will cease altogether for this season from most Swedish ports, as the navigation will most probably in a short time be closed by ice. Scotch pigs, mixed numbers, have declined to 48s., nominal.

LEAD.—No sales. The Royal Proclamation prohibiting shipments has put a stop to business, and caused the market to wear a downward aspect.

TIN.—The speculative demand existing last week has entirely ceased, and the prospect of a rise in English is now reversed, the American news having proved disastrous to the market. An advance would undoubtedly have taken place, the deliveries in Holland of Banca being very large, and several thousand slabs of Straits having been sold here at rising prices—for arrival, 122s., and 120s. cash. The price has now gone back at least 2s. per ton in Straits, and 2s. in Banca.

SPELTER.—Nothing doing—price declining—nominal value, 18s. but no buyers.

STEEL.—Foreign remains steady at 15s. 10s. to 16s. for Swedish keg; faggot, 16s.

LIVERPOOL, DEC. 5.—Our market continued steadily to revive up to last week, when the news of the American outrage on board the *Trent* reached this country, since then little business has been transacted. The general opinion here is that a rupture will take place in our relations with the Northern States, and, as a consequence, buyers are not disposed to operate. Staffordshire iron, however, remains without noticeable change in price. Welsh bars are rather lower, and good makes can be had at 5s. 2s. 6d. to 5s. 5s. at the shipping port. Scotch pigs have been reduced 1s. 6d. to 2s. per ton, with still a downward tendency. Copper was advanced ¼d. per lb. on Nov. 25, but it has not been well sustained. The demand is comparatively small, and orders can be placed under the nominal price. Lead has advanced about 10s. per ton, but it is doubtful if this can be maintained, now that the Government has prohibited its export. Block tin shows no change in price. Tin-plates are dull of sale. Spelter quiet, and rather lower.

COAL MARKET.—On Monday, 53 fresh ships arrived. The market was more depressed than for some time past, the top price of house coal being reduced to 18s. 6d. per ton, and only a moderate amount of business done. Hartley's were dull, and 3d. per ton lower. Manufacturers' steady, and without alteration in value. Best house coal, 18s. to 18s. 6d.; seconds, 15s. 6d. to 16s. 6d.; Hartley's, 14s. 6d. to 15s. 6d.; manufacturers', 13s. to 15s. per ton.—On Wednesday, 127 arrivals. There was more demand for house coals generally, but the supply exceeds it, and prices are without alteration. The quantity of Hartley's and manufacturers' was large, and a little reduction in price was submitted to. Best house coal, 18s. to 18s. 6d.; seconds, 15s. 6d. to 16s. 6d.; Hartley's, 14s. to 15s.; manufacturers', 13s. to 14s. 6d. per ton.—On Friday, a further arrival of 49 ships. The market opened dull for house coal, but on a reduction of 6d. per ton being made the demand was stimulated, and pressure removed. Hartley's, were in fair request, and, upon the whole, a shade higher in price. Manufacturers' without alteration. Best house coal, 17s. 6d. to 18s.;

seconds, 15s. 6d. to 16s.; Hartley's, 14s. to 15s. 3d.; manufacturers', 13s. to 14s. 6d. per ton; 31 cargoes unsold—80 ships at sea. Importation of coals into London by sea in the month of November 947 ships, containing 322,431 tons, being an increase on the corresponding month last year of 38,717 tons. Importation of coals into London by railways and canals in the month of November, 141,082 tons, being an increase on the corresponding month in 1860 of 5819 tons.

LIVERPOOL COAL TRADE.—From the Coal Circular of Messrs. Platt, we learn that the quantity of Cannel, coal, coke, and patent fuel shipped at Liverpool in November was 47,462 tons, and in the corresponding month of last year 31,663 tons, showing an increase last month of 15,799 tons. The total shipments from January to November were 600,465 tons; same period of 1860, 581,946 tons—increase this year, 18,519 tons. The exports of coal (coastwise) during November were 9754 tons; same month last year, 17,232 tons—decrease last month, 7478 tons. Total coastwise from January to November, 83,256 tons; same period in 1860, 144,069 tons—decrease in present year, 60,813 tons.]

The American question is still the all-absorbing topic of conversation, and the late demand for lead is explained by the fact that for the last month or two the Americans have been buying it up. The question now arises, what effect will the prohibition to export lead have upon the market, and, consequently, upon the price of lead ores which do not contain any great percentage of silver? Fortunately, so far, our principal lead mines in Cornwall and Devon produce ores above the average yield for silver; and last year the Cornish lead ores produced 180,757 ozs.; the Devon mines, 53,059 ozs.; some of the mines produce 40 ozs. to the ton of lead, at a value of 5s. 6d. per ounce. The total quantity of silver extracted from the lead ores raised in the United Kingdom last year was 549,720 ozs. We mention these facts, as they may be interesting at a time when various opinions will be expressed as to the probable state of the lead market, and also to show that a fair price may always be calculated upon for ores yielding silver in such quantities as we have described.

In the MINING SHARE MARKET this week there has been a moderate amount of activity, and so far no ill effects have arisen from the causes which have influenced the Stock and Railway Markets. Dividend mines are in request, and there is a good deal of speculative business doing. East Caradon shares leave off firm at 27½ to 28; the last report values the 60 cent, on the counter lode, at 50s. per fm.; Fawcett's lode, at this level east, 10s. per fm.; the 50 east, on the counter lode, worth full 100s. per fm., and easy for working. Condurrow, 50 to 60; a circular has been issued by the purser, stating that Pryce's shaft has proved to be in a much worse condition than anticipated; this has occasioned a great delay in opening out the tin lode in the bottom of the mine, and has "rendered it inexpedient to call the adventurers together earlier than the second Wednesday in February." At the last meeting, in October, the mine was in debt 3240s. 6s. 9d., and a call was not made to pay it off, as it ought to have been under the Cost-book System; and according to the circular just issued, no further meeting is to be held till February, by which time it is presumed the debt will have been increased rather than diminished. Had a call been made at the last meeting, to pay off the debt and put the mine into a proper position, it would, upon the report then furnished, have been cheerfully responded to, and shares, assuming the report to be correct, would have been by this time 150s. each, instead of little more than half the price they were got up to soon after the last meeting. According to the report now circulated by the purser, the shaft is worth for tin 180s. per fathom for the length of it; the 165 east is worth 150s.; the 165 west is worth 80s.; the winze under the 155 is worth 100s.; the stoops in the back of the 155 are worth 30s.; the winze under the 40 is worth 50s. per fm.; copper bargains are worth in the aggregate 150s. per fm. This report is circulated officially, and if we assume it to be strictly correct, why should such a mine be allowed to continue with a heavy debt upon it? And if, as we find, very great differences of opinion exist as to the real state of the mine, it is so much the more necessary that an early meeting should be held. West Basset, 13½ to 14½; in Grenville's engine-shaft, now 2 fms. under the 94, the lode has much improved, and now 4 ft. wide, producing 5 tons per fm., or 10 tons for length of shaft. Wheal Union shares have not been so firm, and leave off 2 to 2½; in the 46, east of Moyle's shaft, the Turnpike lode is reported as 6 ft. wide, worth for tin about 50s. per fm. Wheal Basset, 80 to 85; at the meeting, on Tuesday, the accounts showed a profit of 1638s. 4s. 5d. on the two months, and a dividend of 2s. per share (1024s.) declared, leaving 1549s. 2s. 8d. in hand; the report states that, although the levels are at present rather poor, yet there are several points to come off shortly, which, if they prove productive, will add considerably to the value of the mine.

East Carn Brea shares have fluctuated almost hourly, and there are as many reports, and as many different opinions expressed in connection with them, as there used to be about East Russell reports, in its speculative and jobbing days. That East Carn Brea, however, is in a very rich district, has in it the elements of great success, and is under the financial management of gentlemen in London of the highest standing and respectability, is acknowledged by all, and we hope we shall not see it become a mere jobbing mine for local agents and their friends. The shares leave off 9s. to 9½. The latest official report states, "We have cut the lode in the 26, to the east of the cross-course, and driven 2½ feet into ore, but have not reached the south wall." Bottalack have reached 230 to 240, and much in demand. South Caradon largely dealt in at 330 to 340. Tincroft have advanced to 7½, 8. Devon Great Consols, 365 to 375; the south lode in the 40 east, west of Barnett's cross-cut, at Hitchins's shaft, at Wheal Josiah, is worth 12 tons of copper ore per fm.; the rise in the back of this level 6 tons. Alfred Consols, 12s. to 14s.; Calvadnock, 7 to 7½; Cook's Kitchen, 26½ to 29½; Drake Walls, 18s. to 20s.; East Basset, 60 to 65; East Devon Consols, 1½ to 2. Prosper United, 1½ to 2; the 30, west of ladder-road shaft, still improves both in size and quality; it is now 4 feet wide, and will yield over 6 tons of copper ore per fm.; a part of the lode on the north side is also producing rich work for tin. The agents state that "it is a very valuable lode, which we consider an important discovery, making all in whole ground." They have begun to drive the 20, west of the same shaft, and the lode has this week increased in size from 1 foot to 18 inches wide, and this end is only a few fathoms behind the 30, where the lode has so much improved as above. West Par, 3s. 6d. to 5s., the mine improving; the 65 end is worth 1½ cwt. of tin per 100 sacks, and the winze below the 55 is worth 15s. per fm.; the 55 end is suspended till better ventilated, and the men put to take down some lode in the back of this level, where it produces excellent work for tin; there are five pitches at work, and the tributaries are working with spirit. East Wheal Russell, 2½ to 3; East Wheal Grenville, 30s. to 32s. 6d. Gambler and St. Aubyn shares have advanced to 18, 20. Great Wheal Fortune, 12 to 13. Herodotus, 38 to 39. Rosewall Hill and Ransom shares have been in great demand all the week, and reached 3s. buyers, but leave off 55s. to 60s. Hingston Down, 3½ to 4; Lady Bertha, 13s. to 15s. West Caradon shares largely dealt in at 50 to 53, leaving off 51 to 53. Marke Valleys have advanced to 10½ to 10½; North Basset, 2½ to 3; North Croft, 1½ to 2; North Downs, 5½ to 5½; North Robert, 19s. to 21s.; North Trekerby, 23 to 25; Par Consols, 7 to 7½; Providence Mines, 39 to 41; Sorbridge Consols, 12s. to 13s.; South Frances, 87½ to 90; Stray Park shares flatter, at 31 to 32. Tamar Consols, 1½ to 1½; Wendron Consols, 10½ to 10½. West Fowey, 8 to 8½, and a large business done. West Polmar, 5s. to 7s.; West Seton, 290 to 300. Wheal Arthur shares have advanced to 16s., 18s. Wheal Buller, 75 to 80; Wheal Clifford Amalgamated, 30 to 31; Wheal Grenville, 30s. to 32s. 6d.; Wheal Grylls, 13 to 14; Wheal Ludcott, 2½ to 2½; Wheal Margaret, 42 to 44, and more in demand. Wheal Mary Anne, 16 to 17; Wheal Moyle, 2½ to 2½. Wheal Seton shares have been in good demand all the week, and leave off 125 to 130. Wheal Trelawny, 16½ to 17; Wheal Uny, 4½ to 4½; Great Retallack, 15s. to 17s.; East Budnick and Mount, 4½ to 5; Bottle Hill, 12s. to 14s. Wheal Unity, 14s. to 15s.; the lode has been cut into 2 ft. at the 75

3; Tincroft, 7; West Basset, 13, 13, 13, 13; Wheel Edward, 3; East Caradon, 27, 27, 27, 27; East Carn Brea, 9, 10, 10, 10; Grambler, 17, 18, 17; Great Wheal Vor, 7, 6, 6, 6; West Caradon, 52; Wheal Basset, 80; Margaret, 40; Stray Park, 3; South Caradon, 335. In Colonial Mining Shares the prices were:—Australian, 1; Bon Accord, 1; Dun Mountain, 1, 1, 1; Port Phillip, 1, 1, 1; Scottish Australian, 1; Great Northern Copper of South Australia, 1, 1, 1; Kapunda, 2. In Foreign Mining Shares the prices were:—Dun Mountain, 1; Linares, 7; United Mexican, 8, 7, 8, 7, 8, 8; East del Rey, 1, 1; Mariquita, 1; St. John del Rey, 50, 50, 49, 48.

The closing quotations for shares in new undertakings were:—East del Rey Mining, 1/2; Santa Barbara, par to 1/2; Hindostan Copper, 1/2; and Mwyndy Iron Ore, par to 1/2. Ocean Marine Insurance, 4, 4; Thames and Mersey Marine, 1/2; Universal Marine Insurance, 1, 1; London and Provincial Marine, 1/2; Mercantile Fire, 1/2; Commercial Union Fire, 1/2; Indian Carrying Company, par to 1/2; and Venezuela Cotton, 1/2.

The uneasy tone pervading the Money Market generally has affected dealings to a great extent in Foreign and Colonial Mining Shares during the week; and in Port Phillip, St. John del Rey, and United Mexican, the quotations are lower than those of last week; while East del Rey, Hindostan Copper, and Santa Barbara, are firm. Great Northern have been dealt in at 1, 1, and leave off at 1, 1. St. John del Rey, 49; East del Rey, 1, 1; Worthington nominal, at 10s, 11s; United Mexican, 7, 8. Dun Mountain shares firm, at previous quotations, 1 1/2; Scottish Australian, 1, 1; Port Phillip, 1, 1—a considerable decline in price; Kapunda, 2.

MINING EXCHANGE SHARE LIST.—The following is forwarded to us officially from the Mining Exchange as business done during the week:—
SATURDAY, NOV. 30.—Wheal Union, 3; Stray Park, 3; Grambler, 16, 15, 14; Tincroft, 7; Wheal Seton, 120, 121, 122, 123, 125, 126; Alfred Consois, 14; East Caradon, 27; West Seton, 296; Wheal Edward, 55s 6d.
MONDAY.—Wheal Edward, 2, 13-16ths; Wheal Union, 3; West Poimear, 5s, 7s; Marke Valley, 10, 16, 1/2; North Croft, 40s, 39s; East Caradon, 27; Stray Park, 3, 4; East Carn Brea, 9; Horrold, 38, 1/2; Wheal Seton, 126, 124; Wheal Grylls, 10, 16, 17, 16; West Caradon, 49, 49; Bryn Gwlog, 20, 1/2; Long Rake, 14, 1/2; West Penarth, 360.
TUESDAY.—West Caradon, 51, 51, 52; Wheal Seton, 123, 124, 125; East Carn Brea, 9, 16-18ths, 3/4; East Caradon, 27, 1/2; Wheal Heale, 20; Alfred Consois, 14; Grambler, 18, 20; Wheal Norris, 44s; West Caradon, 51, 50, 1/2; Wheal Grylls, 10, 16, 17, 16; West Seton, 296; Wheal Edward, 40, 1/2, 3/4.
WEDNESDAY.—Wheal Heale, 20; East Caradon, 27, 1/2; Wheal Seton, 127, 126, 127, 127, 127, 127; North Croft, 38s; Stray Park, 3, 1/2; Wheal Grylls, 15, 16-18ths; Wheal Heale, 17; East Carn Brea, 9; Wheal Union, 14s, 14s 9d, 15s; West Wheal Margaret, 12s 6d, 15s.
THURSDAY.—Stray Park, 3, 1/2, 3/4, 3/4; Wheal Union, 23, 1/2; West Par, 4s 6d; Sortridge Consois, 13s 3d; North Down, 5; Wheal Ury, 4, 1/2; Wheal Grylls, 15, 1/2; East Carn Brea, 9, 16-18ths, 3/4, 10; North Basset, 2, 1/2; Wheal Seton, 127, 126, 127, 1/2; West Caradon, 51, 1/2; East Grenville, 31s.

IRISH MINE SHARE MARKET.—Government, Railway, and Bank securities have all experienced a slight fall, with a depression for further transactions. Dividend-paying mines are in steady demand, at an improvement in Wicklow Copper shares of 2 1/2. 10s. on last week's closing price of 53, 55, 10s. being now freely offered. Mining Company of Ireland shares suffered a smart reduction during the week, but have recovered, and are enquired for at 15 1/2. Speculative mines are not in favour at this moment. General Mining Company for Ireland shares are neglected, although the Chairman at this week's half-yearly meeting of the shareholders congratulated them "on the successful working of the machinery erected for the dressing of the company's large deposit of calamine," and holds out hopes that the proprietors will soon have satisfactory results from the sale of metallic zinc and ochre. In Caryfort shares nothing is doing, and Connoree shares are on sale at 31s. 6d., and business unimportant.

Frequently and energetically as we have endeavoured to express our ideas on the subject of the elasticity of British mining interests, we could hardly have hoped for such instant and so decided proofs of the correctness of our position as the experiences of the last two or three weeks have so decidedly and satisfactorily demonstrated. We claim, and we think our pretensions will be admitted, that we possess unusual facilities for judging the probable future of mining interests—that is, so far as human judgment, based on facts, can be founded. Our columns weekly teem with papers and information from experienced pens, going into minutiae, detailing particularities, which we, for obvious reasons, as journalists hold it our duty and province studiously and invariably to avoid. A careful perusal of a few numbers of the *Mining Journal* will show it therein stated that the late decline in metals, and in the mining market, would be but temporary, that the fall therein was not produced by any reasonable or legitimate causes, or by a present or anticipated decrease in consumption to an amount any way equivalent to the extent of the depreciation, and that it arose entirely from some vague, undefined idea and groundless fears. Some of our best advised and most extensive operators in the mining market unhesitatingly proclaimed that a rise of the metals must from very necessity soon take place; that when this should happen, or any discoveries of importance in mines should be made, of which there was a singular absence, an immediate and great advance would ensue; they strenuously advised their friends to invest at the then very low rates at which good veritable stocks might have been purchased, and fortunate were they who acted on the recommendation. Both the predicted important elements of success have appeared, and the consequences so confidently asserted have been realised; metals and their ores have materially advanced, and shares in good mines have been proportionally benefited. We hold it our duty to keep before the public the important fact, that few if any securities offer that permanent and high remuneration British mining affords; in saying this, we must necessarily be understood not to express that opinion individually to every scheme brought before the public under that denomination; but we speak advisedly, when we state that well and carefully selected stock affords, at least, as secure investment, and greater profits, than almost any branch of legitimate British industry. It should be held in remembrance that mining business is more or less speculative; that all interests have their vicissitudes, and from them we do not claim for mining an exemption. We acknowledge mining to be speculative, but not nearly to the extent that it is generally supposed to be. That the mere speculators in the business should not be successful in every instance is not to be wondered at, especially when we consider the reckless folly with which some men enter on a career that requires the utmost caution; but because such are not always fortunate, or they are victimised, mining *per se* should not be condemned, nor should it be by a temporary depression in the value of its products or its stock. We repeat, that to the *bona fide* investor, not to the mere speculator, who is biased by every report, or alarmed at every occasional and transient lull, mining has afforded, does and will afford, a perfectly legitimate, secure, and desirable channel for laying out spare capital as can be commanded, or as the most fastidious and careful calculator can conceive.

At Redruth Ticketing, on Thursday, 4679 tons of ore were sold, realising 26,704 12s. 6d. The particulars of the sale were—Average standard, 136 1/2; average produce, 6 1/2; average price per ton, 5 1/2; quantity of fine copper, 290 tons 11 cwt. The following are the particulars:—
Date. Tons. Standard. Produce. Price per ton. Ore cop.
Nov. 7. 3419 £138 15 0 6 1/2 £5 15 6 £94 1 0
" 21. 6213 139 2 0 6 1/2 5 6 0 91 12 0
" 28. 4148 138 15 0 6 1/2 5 7 6 91 11 6
Dec. 6. 4679 136 2 0 6 1/2 5 14 0 91 17 0
Compared with the sale of last week, the standard remains about stationary. Compared with the corresponding sale of last month, the decline has been in the standard 1 1/2, and in the price per ton of ore about 2s. 3d.

At the Swansea Ticketing, on Nov. 26, 1380 tons of ore were sold, realising 16,047 15s. The particulars of the sale were—Average standard, 119 1/2; average produce, 11 9-16; price per ton, 11 1/2. 6d.; quantity of fine copper, 159 tons 11 cwt. The following are the particulars of the sales during the past month:—
Date. Tons. Standard. Produce. Price per ton. Ore cop.
Oct. 29. 1146 £117 5 3 10 5-16 £9 17 6 £86 0 0
Nov. 13. 1485 118 7 0 12 15-16 12 16 0 98 18 0
" 26. 1380 119 17 0 11 9-16 11 12 6 100 10 0
Compared with last sale the advance has been—in the standard, 1 1/2; and in the price per ton of ore about 4s. Compared with the corresponding sale of last month the advance has been—in the standard 4s., and in the price per ton of ore about 9s. 3d. Of the 1380 tons of copper ore sold on Tuesday, 1192 tons were from British mines, which gave an average produce of 10 1/2, and sold at an average standard of 122 1/2. 1s. 6d.—10 1/2. 2s. per ton of ore. The

remaining 188 tons were foreign ores, which gave an average produce of 20 1/2, and sold at an average standard of 112 1/2. 17s. 6d.—21 1/2. 6s. per ton of ore. On Dec. 10 there will be offered for sale 1450 tons of ore from Cobre, Knockmahon, Berehaven, Ballycunnisk, Laxey, West Kaime, Turkey, Connorree, Cronebane, and Tigrany.

At Wheal Basset meeting, on Tuesday, the accounts for Sept. and Oct. showed—Balance last audit, 534 1/2. 1s. 3d.; ore sold (deducting 257 1/2. 1s. 3d. at 1-15th), 4020 1/2. 1s. 3d.; sundries, 31 1/2. 1s. 3d.—4958 1/2. 1s. 3d.—Mine cost, merchants' bills, and sundries, 2385 1/2. 1s. 3d.; leaving credit balance, 2573 1/2. 1s. 3d. The profit on the two months' working was 1638 1/2. 1s. 3d. A dividend of 104 1/2. 1s. 3d. (21. per share) was declared, and 1649 1/2. 1s. 3d. carried to credit of next account. Capt. Pope, Jullif, Jun., and Middleton reported upon the various points of operation. The pitches throughout the mine are still producing fair quantities of copper and tin ores. Although their levels are at present rather poor, yet they have several points to come off shortly, which, if they prove productive, will add considerably to the value of the mine.

At Boscan Mine meeting, on Tuesday, a dividend of 300 1/2. 1s. 3d. (17. 5s. per share) was declared.

The Tincroft Mining Company declared a dividend of 5s. per share on Thursday. This is the thirtieth dividend already paid, amounting to 10 1/2. 1s. 6d. on each 2 1/2. share.

At Balleswidden Mine meeting, on Nov. 26, the accounts showed—Mine cost for three months ending September, 3409 1/2. 1s. 3d.; coal, 360 1/2. 1s. 3d.; carriage, 174 1/2. 1s. 3d.; merchants' bills, 1602 1/2. 1s. 3d.; dues, 113 1/2. 1s. 3d.—5650 1/2. 1s. 3d.—Tin sold, 3749 1/2. 1s. 3d.; leaving debit balance, 1916 1/2. 1s. 3d. The excess of expenditure has been caused by the erection of the new engine, plant, &c.

At the Great Work Consols meeting, on Nov. 26, the accounts showed—Balance last audit, 1548 1/2. 1s. 3d.; mine cost, July, Aug., and Sept., 3162 1/2. 1s. 3d.; merchants' bills, 1081 1/2. 1s. 3d.; carriage, 210 1/2. 1s. 3d.; dues, 168 1/2. 1s. 3d.—6305 1/2. 1s. 3d.—Black tin sold, 4733 1/2. 1s. 3d.; carriage, 7 1/2. 1s. 3d.; leaving debit balance, 1474 1/2. 1s. 3d. The report of the agents, Capt. N. Trevellick, T. Edwards, and J. Johns, stated there were 14 tawdry bargains, working by 67 men and 7 boys, and 67 tribute pitches, working by 168 men at 12s. 6d. in 17, at 60 1/2. per ton and 10s. in 17, at the present price of tin. The quantity of tin sold for the three months was 62 tons 7 cwt. 3 qrs. 10 lbs., average price per ton, 75 1/2. 1s. 3d. The total number of hands employed underground was 235 men and 7 boys.

At the Alfred Consols Mine meeting, on Nov. 25, the accounts showed—Balance last audit, 1650 1/2. 1s. 3d.; mine cost, July and Aug., 1128 1/2. 1s. 3d.; merchants' bills, 576 1/2. 1s. 3d.; doctor and club, 16 1/2. 1s. 3d.; sublet advanced, 9d.—3471 1/2. 1s. 3d.—Copper ore sold, 1548 1/2. 1s. 3d.; call made, 1642 1/2. 1s. 3d.; leaving debit balance, 279 1/2. 1s. 3d. The loss upon the two months' working was 271 1/2. 1s. 3d. Capt. S. Uren having tendered his resignation, it was agreed that the same be accepted, and that an agent to succeed him be advertised for. The agents' report stated that during the past month they had had a very important improvement in two pitches. At the last sampling they sold 257 tons of ore, which realised 1495 1/2. 1s. 3d., incurring a loss upon the two months of 300 1/2. 1s. 3d., and they calculated on sampling at their next sampling-day 300 tons, worth 1800 1/2. 1s. 3d., which would pay the cost of the mine upon a loss of about 200 1/2. 1s. 3d. on the two months' working.

At the Wheal Falmouth and Sperris Mines meeting, on Nov. 28, the accounts to end of August showed a credit balance of 182 1/2. 1s. 3d. The sales included murex, 2015 1/2. 1s. 3d.; gossan, 1219 1/2. 1s. 3d.; lead, 139 1/2. 1s. 3d.; copper, 357 1/2. 1s. 3d.; and tin, 61 1/2. 1s. 3d. Capt. W. Kite reported on the mine: they state "Our returns have enabled us to meet the expenditure, and the price of murex kept up to what it was last year, our book to-day would have presented a much better balance in favour of the adventurers."

At the Gonaema Mine meeting, on Nov. 28, the accounts for July and Aug. showed a debit balance of 411 1/2. 1s. 3d. A call of 2s. 6d. per share was made, and the pursuer was directed to procure the services of an experienced captain to inspect and report on the general prospects and best mode of working the mine for the future. The next sampling will be about 100 tons of copper ore.

At South Croft Mine meeting, on Tuesday, a call of 10s. per share was made.

At West Wheal Trevelyan meeting, on Thursday (Mr. H. Foord in the chair), the accounts for Sept. and Oct. showed—Balance last audit, 2021 1/2. 1s. 3d.; mine cost, merchants' bills, and sundries, 1063 1/2. 1s. 3d.; dues, 1265 1/2. 1s. 3d.—Called received, 505 1/2. 1s. 3d.; ore sold, 414 1/2. 1s. 3d.; leaving debit balance, 346 1/2. 1s. 3d. A call of 10s. per share was made. Capt. Odgers and Osborn reported upon the various points of operation. They are employing underground 46 men and 5 boys; and at surface, including engine-men, &c., 13 men and 17 boys and girls.

At Wheal Henry meeting, on Monday, the accounts showed a debit balance of 206 1/2. 1s. 3d. A call of 4s. per share was made.

At the Dulta Tin Mining Company meeting, held in Liverpool, on Nov. 28, in lieu of making a further call, some of the shareholders advanced 600 1/2. 1s. 3d. in addition to increasing their interest from the new shares recently created, for the purpose of providing funds for the extra machinery and completing the dressing-floors. The new engine will be erected for pumping and winding, while the present will be altered to carry 40 or 50 heads of stamps. The report from the mine was considered satisfactory; the tribute pitch on Butt's lode, 10 fms. in advance of the bottom end, having improved.

At Wheal Concord board meeting, on Nov. 25, it was resolved to issue a statement to the shareholders explaining the precise position and prospects of the undertaking—the progress made, and the necessity for raising an additional 3000 1/2. 1s. 3d. by the issue of the unsold shares, for the completion of the machinery and the efficient development of the mine. The pump is working well, and during the winter months the water-wheel will give ample power, though in the summer months a small portable engine has been necessary to assist it.

At Wheal Heale meeting, yesterday, the accounts for Aug. and Sept. showed—Mine cost, merchants' bills, and sundries, 1639 1/2. 1s. 3d.—Balance last audit, 172 1/2. 1s. 3d.; calls received, 979 1/2. 1s. 3d.; leaving debit balance, 537 1/2. 1s. 3d. Mr. Jas. Hollow reported that the prospects of the undertaking were fully as good as at the last meeting. He regarded their chances of discovering the current quarter as being most favourable. The sales of tin would enable them to show a profit sufficient to pay off the above debit balance, and leave a surplus at disposal. Capt. Thomas Uren, who has specially inspected the mine, and Capt. Rutter, Jun., and Wesley, the resident agents, also reported very favourably upon the position and prospects of the adventure.

At the Great Brigian Mine meeting, on Thursday (Mr. Eves in the chair), the accounts showed a debit balance of 1427 1/2. 1s. 3d. A dividend of the back costs was made, which amounted to a call of 5s. per share. The appointment of Mr. E. King as secretary was confirmed, and a committee of management were appointed. Details in another column.

At the St. Day United Mines meeting, on Monday (Mr. J. Balster in the chair), the accounts showed a credit balance of 476 1/2. 1s. 3d. The committee of management were re-elected. Details appear in another column.

At Carn Vivian Mine meeting, on Nov. 26, the accounts showed a debit balance of 243 1/2. 1s. 3d. A call of 2s. per share was made.

At the West Sharp Tor Mine meeting, on Wednesday (Mr. P. Cotton in the chair), the accounts for three months ending October showed—Balance last audit, 322 1/2. 1s. 3d.; calls received, 563 1/2. 1s. 3d.; leaving debit balance, 537 1/2. 1s. 3d. August, 192 1/2. 1s. 3d.; Sept., 118 1/2. 1s. 3d.; Oct., 117 1/2. 1s. 3d.; June merchants' bills, 82 1/2. 1s. 3d.; sundries, 18 1/2. 1s. 3d.; leaving debit balance, 390 1/2. 1s. 3d. The balance of assets over liabilities was 21 1/2. 1s. 3d. A call of 3 1/2. 1s. 3d. per share was made. The report of Capt. W. Richards was considered a satisfactory character.

At the Great North Downs Mine meeting, on Wednesday (Mr. Pinnington in the chair), a call of 20s. per share was made, 10s. to be paid down and 10s. upon April 1. Details in another column.

WEATHER PREDICTIONS.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—As I saw there would be nothing particular for the present week, I did not address you for the *Journal*. I think I may refer back to the predictions for this year with some degree of satisfaction. In my "Climate of England" I predicted for the present year cold, severe frosts, and snow, to the end of February; fine April, and fine growing summer; fine autumn, good crops; and mild to December.

The character of the year throughout has been in strict accordance with this prediction. With reference to the weather for the coming week, between the 7th and 9th, there will be some gales, and, to all appearance, attended with thunder, lightning, and rain; also, there may be some strong winds between the 10th and 12th; the end of the week foggy weather with a gale about the 18th. But on this I will again address you for next week's *Journal*.

G. SHEPHERD, C.E.
26, Throgmorton-street, Dec. 5. "Author of the Climate of England."

FORTUNATE MINERS.—Messrs. Cobden, Bright, and some friends, about three years ago, purchased the Dylife Mines for the sum of 24,000 1/2. 1s. 3d., and they were bound also to lay out 10,000 1/2. 1s. 3d. in explorations. Their late returns have been upwards of 200 tons of lead ore per month, which it is believed yields a profit of about 1000 1/2. 1s. 3d. per month, and they expect now to return upwards of 250 tons per month.

MINING IN CARDIGANSHIRE.—The Hafod Lead Mining Company, which has been a short time before the public, may now be considered as fairly established, it being reported that sufficient capital is already subscribed to justify the company in commencing operations, and that there is little doubt of its proving a most profitable investment for shareholders. The sett is looked upon with much interest as being "in the very centre of the best-paying lodes" and the chief agent of the Cwmystwyth Mines has reported that their best-paying lodes run through the Hafod property, which is the best unworked ground in the county. The property to be worked by the company exceeds 2000 acres in extent, and the term and favourable conditions of the lease—40 years at 1-20th royalty—have hitherto been unknown in Wales. The prospects of the undertaking are described as very encouraging, both by Mr. Jehu Hitchens and Capt. Matthew Francis, and large profits are estimated to result from careful and vigorous working by every one who has visited the mines. The capital consists of 10,000 shares of 5 1/2. 1s. 3d. each, but in the first instance it is intended to issue 6000 of the shares only.

THE SANTA BARBARA MINING COMPANY.—A telegram was received in London yesterday afternoon from Liverpool, to the effect that the directors of this company have received advices by the Brazilian Mail of the purchase of the Parí Mine and property having been concluded. Arrangements will be forthwith made to dispatch Capt. Bryant and a competent staff of miners to the Parí. Several reports have been received, per the mail just arrived, which fully confirm the favourable opinions expressed as to the mineral value of the estate, which comprises an area of four square miles. The letters of allotment have been issued, and the development of the property will be at once vigorously prosecuted.

With this day's *Journal* we give a SUPPLEMENTAL SHEET, which contains—Reviews of Dr. Percy's New Metallurgical Text-Book, and Mr. Smiles's "Lives of the Engineers"—also papers on Remarkable Mineral Deposits; Steam on Steep Roads—Important Improvements; Prosper United Mines; The Mining District in which East Wheal Seton is situated, with map; Improved Prospects of English Investments on the Continent; Furnaces; the Government Guarantee on Indian Railways; Economic Railway; Water Locomotion; Locomotion on Common Roads; Mining in Cumberland; Artificial Stone, and Preservation of Timber, &c.

With the MINING JOURNAL of Nov. 23 we gave a SUPPLEMENT, which contains—The School of Mines, Andersonian University, Glasgow; Miners' Association of Cornwall and Devon; Cornish Mining; Pyrites; Observations on the Coal Mines of Belgium—No. III.; Coals Classified; Great Tywarhale Mining Company; On the Internal Heat of the Earth; The Telegraph to India; A New American Gas Coal; Victor Emanuel Mine; St. John del Rey Mine; Steam-Engines and Boilers; Lanharly Hematite Iron Ore Company; Water as a Fuel; Letts's Diaries; &c.

COPPER ORES.

Sold at LIVERPOOL, on Nov. 28, by Mr. J. P. Campbell, ex Marions, from Quebec.

Lot	Tons.	Price per ton.	Purchasers.
1	84	£14 12 6	Williams, Foster, & Co.
2	84	14 11 0	ditto
3	84	14 11 0	ditto
4	22	21 0 0	Sims, Williams, & Co.

LEAD ORES.

Tenders for 460 tons of lead ore, sold by the MINERA MINES, on Nov. 30.

Mines.	Tons.	Price per ton.	Purchasers.
Lot 1	100	£12 18 0	Newton, Keates, & Co.
2	100	12 18 0	Walker, Parker, & Co.
3	100	12 18 0	Newton, Keates, & Co.
4	25	12 13 0	ditto
5	25	12 13 0	Panther Co.
6	10	11 5 0	Walker, Parker, & Co.

Sold on the 24th December.

Mines.	Tons.	Price per ton.	Purchasers.
Newtownards	75	12 12 0	A. Courage & Co.
East Loggias	70	12 4 0	Sims, Williams, & Co.
Gloglach	60	16 1 0	ditto
Cwmystwith	60	13 0 0	ditto
Goginan	41	16 13 0	ditto
ditto	9	15 5 0	Walker, Parker, & Co.

Sold on the 5th December.

Mines.	Tons.	Price per ton.	Purchasers.
Tassan	25	12 4 6	A. Eytton.

BLACK TIN.

Sold on the 30th November.

Mines.	Tons.	Price per ton.	Purchasers.
St. Day United	22 10 0	£22 0 0	£1395 8 3—Trehellan.
ditto	16 1 3	62 0 0	997 10 8—Melland.
Gt. Wheal Bury	7 4 2	63 0 0	455 15 10—Carvedras.
ditto	0 8 3	45 0 0	19 14 1—ditto

Sold on the 3d December.

Mines.	Tons.	Price per ton.	Purchasers.
ditto	7 7 3	63 0 0	465 12 9—ditto
ditto	0 16 2	63 10 0	49 18 9—ditto
ditto	1 1 2	45 0 0	48 10 8—ditto

COPPER ORES.

Sampled Nov. 20, and sold at Tabb's Hotel, Redruth, Dec. 5.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Clifford Amalgamated	113	£26 9 6	Wheal Basset	20	£16 2 0
ditto	112	6 8 0	Wheal Seton (Pendennis)	69	1 6 6
ditto	110	6 11 0	ditto	67	5 11 6
ditto	105	6 9 0	ditto	60	6 7 0
ditto	95	4 14 6	ditto	42	6 17 0
ditto	84	4 6 6	ditto	38	5 11 0
ditto	83	15 18 6	ditto	30	2 14 6
ditto	74	5 17 0	ditto	29	13 14 6
ditto	71	3 14 0	Condurow	94	2 19 0
ditto	72	6 10 0	ditto	50	2 10 0
ditto	47	7 7 0	ditto	50	2 2 0
ditto	19	4 12 6	ditto	45	7 16 6
Engine ore	62	8 1 0	ditto	28	0 7 6
West Seton	91	5 9 0	ditto	21	2 16 6
ditto	90	7 7 6	South Frances	91	5 7 6
ditto	88	10 0 0	ditto	47	10 0 0
ditto	80	8 16 6	ditto	45	5 7 6
ditto	69	8 11 6	ditto	30	5 6 6
ditto	68	6 19 6	ditto	7	3 14 0
ditto	61	2 18 0	South Tolgus	80	11 1 0
ditto	43	2 18 0	ditto	53	4 10 0
ditto	41	6 12 0	ditto	50	4 9 6
Tincroft	80	1 1 6	East Basset	76	5 3 6
ditto	60	2 19 6	ditto	58	6 1 6
ditto	58	2 16 0	ditto	27	11 10 0
ditto	57	5 7 0	New Treleigh	61	3 10 0
ditto	56	5 7 6	ditto	46	3 10 0
ditto	46	5 4 6	ditto	28	8 8 6
ditto	29	11 10 0	Camborne Vein	57	7 3 6
ditto	20	2 3 6	ditto	23	1 0 0
East Pool	75	4 13 0	Stray Park	66	3 6 6
ditto	62	3 10 0	ditto	35	0 10 0
ditto	57	3 14 6	ditto	22	11 0 6

THE CARDIGANSHIRE CONSOLIDATED MINING COMPANY (LIMITED).

Increase of nominal capital to £50,000. In 10,000 shares of £5 each. The shareholders will not be liable beyond the amount of their respective subscriptions. 5s. per share to be paid with application, and 10s. per share on allotment.

DIRECTORS.
CHARLES COPLAND, Esq. (Messrs. Copland and Co.), Bury-street, St. Mary Axe.
JOHN KILNICK, Esq., Bury St. Edmunds.
PARKE PITTAR, Esq. (Messrs. P. Pittar and Co.), 26, Gresham-street.
PERCY MARSH SHARP, Esq. (Messrs. Hancock, Sharp, and Hales), 20, Tokenhouse-yard.
SOLICITORS.—Messrs. Hancock, Sharp, and Hales, 20, Tokenhouse-yard.
CONSULTING MINING ENGINEERS.—Messrs. Phillips and Darlington, 26, Gresham-street.
BANKERS.—London and Westminster Bank, Lothbury.
AUDITOR.—Charles Eley, Jun., Esq., 27, Great George-street, Westminster.
LONDON MANAGERS, AND OFFICES.—J. H. Marchison, Esq., No. 117, Bishopsgate-street Within.

BROKERS.
 London..... Messrs. Alexander and Lindow, 21, Tokenhouse-yard.
 Manchester..... James Gorton, Esq., Newmarket Chambers.
 Aberdeen..... H. C. Oswald, Esq., Marischal-street.
 Exeter..... Mr. John Harris.

ABRIDGED PROSPECTUS.

This company holds the celebrated lead and copper mines of Sir Carbery Price, known as Esgair-hir and Esgair-fraith, situated in the rich mineral district of Cardiganshire. Messrs. Phillips and Darlington state, "It is quite certain that the old men made enormous returns from the ground near the surface, and that the mine has from time to time commanded very considerable attention. It would be requisite that adequate capital should be provided, and in case of this being found we are of opinion that the Cardigan Consolidated Mine offers more than average security for the money so employed. We may further observe, that the lode in this mine appears to be very analogous to that of Wildberg, in Germany, which, under our management, returned about £55,000 worth of ore in a period of 2½ years, and which undertaking has been worked during several centuries, and at various periods afforded large profits to the proprietors.

Among the reports will be found a joint one from the managing agents of the Dyffide and the Dyffwngw mines, who have minutely examined the Cardigan Consols property, and having traced the lode for the distance between these mines, they confirm the previous belief that Cardigan Consols is on the Esgair-fraith lode of Dyffide. The Dyffide Mines were purchased about three years ago by Mr. Bright, M.P., and his friends, for the sum of £24,000, and they were bound also to lay out £10,000 in explorations, &c. The returns are now upwards of 200 tons of lead ore per month, which it is believed yield a profit of about £1000 per month. At Dyffwngw, adjoining Dyffide, they are making a profit of about £200 per month, and likely to improve.

The managers of Dyffide and Dyffwngw also state that if their recommendations are carried out at Cardigan Consols, "it is our firm opinion that the mine would again open out productive, and large bodies of ore be discovered. It would then prove itself to be what it was always supposed to be by those who have known it longest and best—viz., one of the first in the kingdom. We speak from experience of 30 and 20 years in a similar stratum to yours. And what we recommend you to do we have already done something similar ourselves. And we are now carrying on works of the same magnitude on the very same lode." Mr. Davies, of Dyffwngw, also states in a letter, "we consider that Esgair-hir has a national character, and if this mine turns out a complete failure, nothing is safe."

In a letter also, written by Mr. John Taylor, Jun. (of Messrs. John Taylor and Sons), dated April 22, 1857, he states, "As to the mine itself (Cardigan Consols), then called Welsh Fossil, I have a high opinion. This opinion is not formed from personal inspection, for I never was on the spot; but I have watched the returns of ore from it for very many years, and I have received many reports on the lode from competent judges. Moreover, I know the character of this lode well at the Dyffide, where I have the management."

Applications for shares, in the form annexed to the prospectus, accompanied by a deposit of 5s. per share, may be addressed to the directors or to the brokers. On allotment, 10s. per share additional will have to be paid, but if no shares are allotted the deposit will be returned.

Detailed prospectuses, with the reports, and forms of application for shares, may be obtained at the office, 117, Bishopsgate-street Within, E.C., or from any of the brokers. The prospectus will also be found at length in the *Times*, *Daily News*, *Morning Post*, *Economist*, *Mining Journal*, and *Limited Liability Journal*, of 30th November.

THE WISCONSIN MINING AND SMELTING COMPANY (LIMITED).

Incorporated under the provisions of the Joint-Stock Companies Act, 1856, by which the liability of the shareholders is limited to the unpaid amount of their shares.

In 9000 shares of £1 each; 10s. per share on application, and 10s. per share on allotment.

DIRECTORS.
 Lieut.-Col. J. R. ABBOTT, 9, Portdown-road, Maida Hill, Paddington, W.
 The Rev. ALFRED WALNE, LL.D., Bunbury, Cheshire.
 E. NICHOLAS, Esq., 43, Barbican, London, E.C.
 (With power to add to their number.)
AUDITORS.—To be appointed at the first general meeting.
BANKERS.—Bank of London.
SOLICITORS.—Messrs. Hobbs and Weddon.
SECRETARY.—William Waite, Esq.
MANAGER AT THE MINE.—Mr. David Strickland, Cornwall.
OFFICES.—63, CORNHILL, LONDON, E.C.

This company is formed to develop on the English principle certain parts of the rich lead mines in North America.

It is a well-known fact, that one of the richest deposits of lead ore exists in the region of Wisconsin; and although three quarters of a million pigs of lead (71 lbs. each), are raised annually by poor labouring miners of the district, without any capital whatever, it has yet to be developed by properly-directed mining enterprise.

By the formation of railways (intercontinental), and other means of communication, the time has arrived for the employment of the ordinary appliances and engineering skill, to work the mines by the same method usually adopted in Cornwall and other mining districts in England.

The purchase of 160 acres is effected, and a lease granted in perpetuity—including water machinery, that will only require repairs to keep the mine unwaters for many years to come, which is also purchased.

The mine is really discovered, most of the speculative work effected, and valuable lodes laid open for a considerable distance that will simply require the requisite plant and appliances to thoroughly develop their riches.

In comparing the future prospects with the past, the following are the particulars:—The poor men were allowed to paid 6s. 8d. in £1 royalty. The future is only 1s. 4d., saving in this alone, 5s. 4d. in £1. And by smelting the ores on the premises another saving of 25 per cent. will be effected, leaving a clear profit of 10s. 4d. in £1, compared with the past working.

The lead ores are of the very best quality, and worth, by Johnson's assay, 80 per cent. for lead. Samples of ores taken from the mine may be seen at the office of the company. Ready-money sales for the lead can be obtained in America, at a higher price than in England. The present war raging can have no other effect on the mine than to raise the price of lead, being nearly 2000 miles from it.

Very little more will be required than the necessary appliances. Houses and machinery to bring the mine into a complete dividend-paying state; and 3000 shares of 20s. each share, will be issued for this purpose.

In the deed of incorporation, powers will be taken for securing all other valuable mineral lands, as well as for all other necessary purposes, and it is further proposed that operations shall commence when such amount of capital is subscribed as in the judgment of the directors will enable them to do so.

A careful survey of the mine has been made by Capt. Stickland, of Cornwall (since receiving the report of Capt. Chynoweth and Heathcock, which is hereto annexed), who appear to be thoroughly satisfied that a profit can be clearly shown within four months from commencing operations, by employing 30 men (provided the ores are smelted on the premises), of £250 per month, which will progressively increase so that from 50 to 100 per cent. per annum, can be realised the second year.

Five per cent. will be deducted for commission and other preliminaries. Should no allotment take place, all deposits will be returned in full. NO APPLICATION FOR SHARES after MONDAY, 16th inst.

REPORTS.

By your request, we beg to send you our report of the Pedlar's Creek Mine. This mine is situated about seven miles from Mineral Point, at which place there is a railway station, with a proper communication to all the principal cities and towns in America. This mine comprises a large tract of land, and embraces twelve well-known lodes, which traverse the entire length of the set from east to west, and from north to south. Some of those lodes have been worked on for some distance, and will form junctions where they intersect each other: here is the place where we expect to find the heaviest deposit of mineral. Although the mine has only been sunk 60 ft. deep, there have been many thousands of pounds of mineral returned, and still leaving it good going into water. For want of the needful there it must stay. In bringing a level from the valley to cross-cut the north and south lodes, the men discovered the back of a blue floucan opening, they sunk it to about 10 ft., and opened out a place about 50 ft. wide, the whole breadth being interspersed with lead. The end, sides, and all of this excavation are of this kind of stuff. Four men can keep a horse within running all the time, it being only 60 ft. from surface. This mine can be worked with little capital, as there is plenty of water-power to be applied for sinking and operating on to any extent that may be required. In sinking the pump-shaft on the junction, you will be in a position to bring water within 20 ft. of the spot where the shaft should be sunk, and then run the levels on the course of the lodes east and west, north and south, and in the meantime work on the blue floucan opening, which is considered 100 ft. wide; by so doing—

Thirty men can raise 2700 lbs. of lead ore a day, worth at least \$81
 Hauling and bringing to surface \$ 5
 Thirty men's wages 30
 Dressing 10 = 45

Profit per day \$ 36
 Profit one month £172 or \$864
JAS. CHYNOWETH, JOHN HEATHCOCK.

I have lately inspected the Pedlar's Creek Mine, in the county of Iowa, State of Wisconsin, adjoining Lake Superior, North America. There is a railway leading to all parts of America, not more than seven miles from the mine. The strata are chiefly composed of limestone, reasonable to excavate. The lodes are well defined, and make solid ores within a few feet of the surface. The lead ground is left for a roof, and is sloped to water, leaving it rich going into water; consequently there are no levels, but one continued open bottom the whole extent of the workings. I also examined another mine close by, where poor men stoped the lodes in the same manner for 1800 fms. long; thus showing the regularity and richness of the lode. The lead ores are of the best quality, and worth 80 per cent. for lead. Smelting the ores on the premises will save the company 25 per cent. The value of the raw ores is about £12 per ton of 2000 lbs. I have examined some smelting works in the district which are simple in construction, and very economical in use. £250 will build works sufficient to smelt 6 tons per day. The set contains twelve rich lead lodes—but only two have been worked on, as before stated. The whole of the lodes can be opened up by driving two levels, 40 fms. each in length, which will take twelve months from the commencement of operations. You may safely at the end of the year divide 15 per cent. on the capital. The works have been carried on entirely by poor labouring miners, they paying one-third royalty, doing all the extra work, and paying every expense incident thereto. Independent of the twelve lodes before mentioned, there is a floucan 10 ft. thick, containing rich solid cube lead throughout, and opened on about 40 ft. wide; at this place 30 men can be set to work immediately after the machinery is put in good order; and by smelting the ores on the premises, these men can raise 32 tons of lead per month, which will leave a clear profit of £250. I consider that it will take twelve months to open up the whole of the lodes, and when this

is done I fully believe the mine will be in a position to pay £1000 per month profit. I beg further to state that I have been a superintending agent in Cornwall for many years and I confidently assure you that I never inspected mines before where ores made so shallow, where there is such a quantity of ores in sight, and where there is such certainty of immediate and lasting profit.

By DAVID STICKLAND.

THE PROGRESS OF MINING IN 1860, BEING THE SEVENTEENTH ANNUAL REVIEW.

By J. Y. WATSON, F.G.S., Author of the *Compendium of British Mining* (published in 1849), *Gleanings among Mines and Miners*, &c.

The SIXTEENTH ANNUAL REVIEW OF MINING PROGRESS appeared in the MINING JOURNAL of December 31, 1859, and January 7, 1860. A FEW COPIES OF THE REVIEW OF 1855, containing Statistics of the Metal Trade, the Dividends and Percentage Paid by British and Foreign Mining Companies, and the State and Prospects of upwards of 200 Mines. Also a FEW COPIES OF THE REVIEW OF 1852, 1853, and 1854, MAY BE HAD ON APPLICATION AT MESSRS. WATSON AND CUELL'S Mining offices, 1, St. Michael's-alley, Cornhill, London. Also, STATISTICS OF THE MINING INTEREST. By W. H. CUELL.

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MINING AND ENGINEERING CONTRACTS EFFECTED.

Notices to Correspondents.

THE SYSTEM OF COAL MINING AS PURSUED IN THE NEWCASTLE DISTRICT.—I beg to inform "Inquirer" that I will give him detailed answers to his Queries, contained in his letter in the *Mining Journal* of Nov. 30, in the Journal of next week.—M. E.

LIQUEFACTION OF GOLD QUARTZ.—In the Journal of Feb. 2, 1861, there is an article concerning Dr. Hardinge's (of New Orleans) invention, to dissolve siliceous earth (silica) by a minimum of liquid alkali, and to produce, by an addition of metallic oxide, plastic marble. Should there already exist in England a manufactory of that kind of plastic marble, the practical possibility of carrying out the matter on a larger scale consequently being proved, I should be inclined to enter upon negotiations, either with the inventor or with the bearer of the patent, to exercise the invention in Germany.—CARL CLAUS: Nurnberg, Bavaria.

SILICATES AND SULPHURETS OF GOLD.—Although it always gives me great pleasure to read such original letters as those of your golden correspondent, G. F. Goble, I was doubly gratified on perusing those respecting the silicates and sulphurets of gold, because for years I have felt convinced the ancients must have collected the precious metals in a way moderns cannot procure them. Besides, I have frequently sent to Swansea samples of mudlike which the assayer stated contained gold. I, therefore, hope Mr. Goble will give the world such a valuable re-discovery, even if he patents it. F. PARRY: Carnarvon.

GOLD IN WALES.—Since a valuable contributor to the Journal imagines one of my epistles was levelled at him, I merely ask did it hit the object as hard as "Caveto," and what is meant by refusing to join such a company when at Dolgelly? I also should like to know what Mr. Williams (Liverpool) means by this district, or that it is well he have Mr. Entor to call round at Dolgelly. And why should I have felt annoyed by any practical man giving out truthful scientific reports, particularly when I know no more about Mr. Entor than I do of the proprietors of the Clogau or its neighborhood? I, therefore, must possess a very sensitive skin to feel chafed by any foggy wind blowing behind my back while exploring a country I receive not the least pecuniary interest in advocating; consequently, so long as I can remain a free southerner on British soil no N. E. breeze will prevent me from writing truth, whether it hit or miss. Then, again, doth not official reports quote Mr. Williams's district to yield about a pound of pure gold per diem? Then, pray, how many days, months, or years might gold be got in Wales?—G. F. GOBLE: Bala.

FOSSILS.—If this should meet the eye of any Cornish collector, the writer would be glad to exchange fossils from the Silurian limestone and the coal measures, consisting of organic remains and plants, for Cornish minerals and crystals, or fossils from the Devonian series. Apply H. J., care of Mining Journal office.

MINING IN SCOTLAND.—In the Notices to Correspondents in last week's Journal I see that reference is made to my writing papers on that subject. As to a mine on the Erins estate, Lochyne, I beg to tell "Scott" that I know it well. There are on that estate mines of copper, lead, blende, and iron. I believe the cause of their not being worked long since has been the very high terms demanded by the proprietor, and I have told him so many times. I hope the present lessees have them under greatly modified conditions, or they cannot be wrought at a profit. I have very little doubt as to the future of Scotch copper and lead mining, as soon as prejudice shall have been conquered. The mines at Lochwinnoch and West Kaimie afford pretty good earnest of what will follow.—THE AUTHOR OF THE TWELVE PAPERS ON "MINING IN SCOTLAND": Lochhead House, Lochwinnoch, Dec. 3.

THE SILVER VEIN MINING COMPANY.—The letter from Mr. Squire, descriptive of his process, and the results of his recent experiments, will appear in next week's Journal. CLIJAH AND WESTWORTH MINES.—A report being in circulation to the effect that this property is about to be wound-up, I enclose a letter received from the secretary, Mr. R. H. Pike, giving a distinct denial to such report; and in reverse, several important points in progress are about being opened, which will have the effect of causing a different value being set upon the property to what now exists.—A SHAREHOLDER.

DEVON GREAT CONSOLS.—In reply to our correspondent, "An Inquirer," as to the quantity of ore sold from these mines, and the amount of money realised, we may state that up to December last there had been sold 325,585 tons of copper ore, which realised the sum of 1,940,000l. During the 11 months of the present year there have been sampled 18,795 tons of copper ore.

Sr. JUST UNITED MINES.—I am truly delighted to find that the lord, after holding out for so many years, has at length been persuaded to grant a lease of the St. Just United Tin and Copper Mines, and that they are about to be set to work in a thoroughly business-like manner, under the guidance of my worthy old friend, that splendid mining captain, John Cartnew. These much coveted mines, as is well known, actually team with riches, and most fortunate indeed are they who have succeeded in obtaining the sett, there being no speculation whatever in this instance. These mines will pay most handsomely, and that immediately—nay, they are at this moment returning a good profit, though they can scarcely be said to be legitimately at work. It is the opinion

of one of the first practical mining authorities of the day that the St. Just United Mines will, within two years, pay the shareholders cent. per cent., and this I believe to be no exaggeration, but sober truth.—A TINNER.

THE ANNUAL REVIEW OF MINING.

By J. Y. WATSON, Esq., F.G.S.

This valuable Epitome of Mining Progress is in course of preparation for 1861, being the Eighteenth Year. Pursers, agents, and others concerned, are requested to forward all their information, with as little delay as possible, either to our office, or to Mr. Watson (Watson and Cuell, St. Michael's-alley), that complaints may not be made of defects or omissions.

THE MINING JOURNAL

Railway and Commercial Gazette.

LONDON, DECEMBER 7, 1861.

THE WELSH COAL TRADE.

[FROM A CORRESPONDENT.]

At one time the causes of Welsh v. North Country Coal and North Country v. Welsh Coal, were regarded as all important amongst the members of the coal trade, but as "when two fires meet they do consume the thing that feeds their fury," the subject has gradually decreased in interest, until purchasers had begun to flatter themselves that they would not be further troubled with fallacious arguments, in which facts stated as general were applied as particular; erroneous conclusions being thus drawn, which could only mislead instead of guiding them in their transactions. As the Welsh coalowners could hope for no additional advantage from continuing this discussion, it has been permitted to give place to a rather fierce contest between "Carbon," of Aberdare, and Mr. John Nixon, of Cardiff, the representatives of two well-known qualities of Welsh steam coal—Nixon's Navigation and Thomas's Merthyr. Whether we regard the letters of the disputants as examples of bold assertions inflexibly maintained, or of determined efforts to prove that which it is desired to prove regardless of all obstacles, logical or other, we must admit that both gentlemen are entitled to equal credit. Mr. Nixon states that "the superior value of the upper four-foot seam in the Aberdare district is so well known that it seems futile to comment upon it;" to which "Carbon" replies, that such eminent authorities as Miller, Hoffman, and Frankland show in their official report that the upper four-foot seam is of lower evaporative power than either of the other seams experimented upon (the 9 feet and the 2 feet 9 inches); this is, doubtless, one point for "Carbon." But, says Mr. Nixon, the other colliery proprietors (which includes "Carbon") mix the produce of nine seams, and this "Carbon" does not directly deny, but says that, with one or two exceptions (which exceptions may include "Carbon's" colliery), there are only three seams worked. Until "Carbon" positively states that in the coal sold as "Thomas's Merthyr" there is none from other than the three seams, this is a point in Mr. Nixon's favour.

To review the dispute impartially, it certainly appears that much may be said on both sides; it seems that the evaporative power of Thomas's Merthyr has been stated high, assuming Mr. Nixon's statement that the coal from the nine seams are mixed; but before Nixon's Navigation coal is taken as the best in the market, Mr. Nixon has to prove that the coal from the four-foot seam is not liable to break down to small; and as he states that his prices are higher than those of other colliery owners, he must show that 1½ worth of his coal will do more work than 1½ of other coal, yet will not occupy more room for storage. This is where "Carbon" seems to have the advantage; he says that he sells coal of high evaporative power at a low price, and infers that it is not liable to break down to small. If he can prove this to be the case, he need not fear but that he will secure an ample market for it. The statement that Nixon's Navigation coal is 20 per cent. better than the ordinary Welsh coal is simply absurd, and there are many North Country coals which could easily compete with it; and the official letter of the Storekeeper-General, that it is found inexpedient to confine the supply of coal for Government use to the four-foot seam, does not seem to bear out Mr. Nixon's assertions. The whole of the coals in the Merthyr and Aberdare valleys are known by practical men to be so nearly equal in quality that price alone should decide which particular owner is patronised.

THE PROGRESS OF RAILWAYS IN SOUTH WALES.

Last year there were several new railways proposed for the western counties of Wales, but the only two for which Acts were obtained were the Llanelli Railway and Dock Extension from Llandilo to Carmarthen, and from Pontardulais to Swansea, and the Devil's Bridge and Aberystwyth branch of the Direct Manchester and Milford Haven Railway. The Llandovery and Brecon line was abandoned, with the promise of introducing it afresh this year, but no mention has been made of it, although it forms an important link in the narrow gauge communication with London and the midland counties. The Milford, Fishguard, and Cardigan line was also a complete failure, notwithstanding the ostentatious support it received from two or three professional men. We proved, beyond reasonable doubt, when the proposal was first made, that it was impracticable, and the result is precisely what we expected. Besides, the course we advised has been adopted by the Carmarthen and Cardigan Company, who have given notice of their intention to apply to Parliament in the next session for powers to extend their line from Llandissul to Newcastle Emlyn. To avoid any confusion, we would state that the Carmarthen and Cardigan line commences at the Carmarthen station of the South Wales line, and goes nearly direct north to Llandissul, a distance of 19½ miles; the extension now proposed is to Newcastle Emlyn, about eight miles to the north-west. The scheme has been very warmly espoused in the district more particularly interested in it; and at a recent meeting in Newcastle Emlyn, which represented the territorial wealth and influence of the locality, several gentlemen voluntarily undertook to canvass for shares, in the hope of obtaining 20,000l., or one-third of the cost of constructing the line.

As we have more than once explained, about 14 miles of the Carmarthen and Cardigan Railway, from Pencader to Carmarthen, forms part of the western thoroughfare from Milford to Manchester, and hence its importance. The line from Pencader to Llandiloes is in progress, although very little has hitherto been done; and perhaps to its tardiness we are in some measure indebted for the backwardness of the works on the Carmarthen and Cardigan line; but a dispute with Mr. Jay caused a loss of several months, and nothing was done during the whole of the summer. That dispute has, however, been arranged, and Mr. Jay is no longer the contractor of the line. His bonds and shares have been purchased by Mr. Holden, of Birmingham, who has undertaken to complete the line to Llandissul by October next, and to Newcastle Emlyn by the following summer. This has inspired new life and energy into the company, and if the directors observe ordinary vigilance in their proceedings the line will be in operation to Newcastle Emlyn in about two years, and the chances of a dividend will then depend upon circumstances under their own control, as there will unquestionably be a large traffic over the line. The local traffic in itself will be considerable, but to that we must add an enormous through carrying trade.

Another part of this scheme contemplates two mineral branches up the Gwendraeth. The connection which now exists between the coal and lime districts and the Carmarthen and Cardigan line is through the South Wales Railway, into which numerous railways and tramroads run from the coal field and the limestone rocks, but the nearest of which is the Llanelli line, which is inconvenient, and, besides, leaves an extensive portion of the coal field unprovided; and for some time past the propriety of opening up the Gwendraeth by a mineral line has been discussed, and the old Carmarthenshire tramroad being still in tolerable preservation, steps were taken for its restoration, which could be easily accomplished. It was also suggested that the canal which runs through the valley should be converted into a railway, and of the two schemes this seemed to obtain most favour. But neither of them was perfected, and now the Carmarthen and Cardigan Company are prepared to make two branches from the Kidwelly station of the South Wales Railway to Mynydd-y-garreg, and to Pontyberem, for the purpose of supplying the mineral traffic on their line. Limestone is quarried at Mynydd-y-garreg, where the outcrop of the carboniferous series is boldly developed. There are several collieries in the route of the line to Pontyberem, where Mr. Watney does a large coal trade, and has also some blast-furnaces for iron. Those who promote the resuscitation of the old Carmarthen tramroad and the canal scheme object to these branches,

as incompetent to meet the mineral traffic of the valley; but it should not be forgotten that their inactivity and want of energy afforded an opportunity to the Carmarthen and Cardigan Company to introduce their branches, which we are informed will be made forthwith, probably before an Act is obtained. All the land required for the lime branch, except three patches, making altogether under 5 acres, has been agreed for; and, if the proprietors throw no obstacles in the way, Mr. Holden will proceed with the work immediately; and, we believe, he will also go on with the coal branch. We cannot hope for any modification of the plan, but had it been possible we should have preferred a line susceptible of extension to Mynydd-mawr. However, if those branches are made, it should not deter the colliery proprietors from working out the other methods of communication. But this is a subject of so little general interest than we cannot discuss it fully, our object being to indicate the extension of the railway system in South Wales.

UNIVERSAL MINING LAWS.

We have ever contended that nothing conduces more to secure strict observance of a law than the making of its provisions known to everyone. It is by it; so there is nothing more calculated to ensure the enactment of wise and useful laws than the thorough diffusion, both amongst legislators and that portion of the community interested, of a knowledge of the enactments that have been tried, or are being tried, in other countries, and of the results which have attended their operation. Upon a former occasion we referred to the publication in Germany of a periodical review of Mining Law—die Zeitschrift für Bergrecht; and as the issue has been continued to the present time, an opportunity is afforded for judging of the merits of the work with some degree of accuracy. The character and design of the review in question may be stated in very few words; it is a careful and systematic summary of the mining laws of all nations, and its object is to afford to all connected with the working of mines brief and intelligible expositions of the laws obtaining in every district where mining is carried on, and to enable miners, wherever they may be, to work with the greatest advantage, by placing within their reach a ready means of learning how to secure all the benefits which the laws of the land have provided for them.

As we naturally test the accuracy of a legal work by referring to the manner in which it treats of laws with which we are intimately acquainted, we first turn, in perusing the Zeitschrift für Bergrecht to the chapters relating to English law, and find that much space has been devoted to the consideration of the Coal Mine Inspection Act, which came into operation in January of the present year. The subject is well treated, and to render the remarks perfectly intelligible to all, the entire Act has been translated and printed opposite the English text; the accuracy of the translation is beyond praise, and will, doubtless be duly appreciated. The Zeitschrift is issued in quarterly parts of about 150 pages each, the first for the present year having recently made its appearance; in the editorial portion it contains the Tuscan law of 1788, with remarks upon it, and an interesting sketch of the most recent mining laws of England, Spain, Portugal, Sweden, Austria, Prussia, Bavaria, Wurtemberg, Baden, Hesse-Darmstadt, and Nassau. In the portion devoted to original papers there are eight very valuable treatises by well-known authorities on mining law; not the least interesting being that by Baron von Hingeman, of Vienna, "On the Reform of the German Mining Laws." The other portions of the work are equally useful, and the reviews of mining literature are comprehensive and impartial. Wherever mining or mining law is taught the "Zeitschrift für Bergrecht" is certainly entitled to a place; and if future numbers be as carefully prepared as those which have already appeared the work will no doubt obtain a high reputation, and become a universal text-book on the subject of which it treats.

THE CARDIGANSHIRE CONSOLIDATED MINING COMPANY.—The prospects for increasing the nominal capital of this company has been received with much favour, and little doubt is entertained that, with vigorous and judicious operations, the mines will be made largely profitable. According to the agent's report, received this week, several points are looking very promising, but the workings will be much extended, and pushed on with activity, when the new capital is subscribed. It is not at all likely that the whole sum will be called up, but shareholders know the limit to which they are liable, and that, under any circumstances, they can be called upon only for the amount of their respective subscriptions.

MINING IN NEWFOUNDLAND.—Although as yet little of importance has been done to interest the mining public, there is good reason to believe that this state of things will not continue much longer. That valuable minerals do exist in this colony the beautiful specimens of copper, lead, and silver brought under public notice, and procured from various districts, amply demonstrate; yet large sums of money have been spent without resulting in success. Extensive operations are now, however, being carried on upon a remarkable deposit of ore at the Terra Nova Mine, in the north part of the island. The lode is in the bed of a brook, from which the water has been turned into another channel, in order to admit of the ore being worked. This lode is of a very promising character, the ore is nearly uniform in quality from one end of the shaft to the other, and of the quantity raised to grass not one-fourth is rejected as unfit to send to England for sale. Should the mineral increase in quantity, as it appears likely to do, this mine is destined to make a great noise in the mining world; indeed, there seems to be scarcely any limit to the quantity that this mass can supply. This account seems fully to confirm the report of the value of the Terra Nova Mine published upon the authority of another correspondent, in last week's Journal.

THE WISCONSIN MINING AND SMELTING COMPANY, the prospectus of which may be seen in another column, is formed for the purpose of working a lead mine and smelting the ores in the State of Wisconsin, in North America. The mineral wealth of Wisconsin in lead is great, inasmuch as three quarters of a million pigs of lead are annually raised by poor men without any capital whatever. Although on this side of the Atlantic little is known, except an occasional report of shares changing hands in Wall-street at a premium of several thousands per cent., there is, however, little doubt that the many important lodes now opened on will be extensively worked as soon as capital can be raised. The Wisconsin is no new adventure, but a thoroughly-proved undertaking. We have seen the inspecting agent, who is confident of its success; and that the profit in the first fourteen months from the commencement of operations will yield 30 per cent. dividend, and promises an increasing one the second year. From a careful examination of the prospectus, reports, and calculations, placed before us, we see no reason to doubt the accuracy of these statements. Hitherto poor labouring miners have been the sole workers of the mine, and paying a heavy royalty. If they can do this, and make it pay, by merely working the surface, it follows that a well-organised company, with a moderate amount of capital, efficient machinery and engineering skill, as in England, and only paying a small royalty, as well as smelting the ores, cannot fail to make considerable profits; and it may be safely recommended to the notice of the public generally.

STEAM CULTURE.—For some years the firm of Clayton, Shuttleworth, and Co., has enjoyed a high reputation for their portable agricultural steam-engines and machinery, the adoption of which have now become so general that there are few districts where the name at least of the Stamp End Iron-works is not known. Some years ago the unserviceable character of portable steam-engines formed an obstacle against their general use, the experience of many of those who employed them being of the most unfavourable kind. This circumstance was deeply to be lamented, as presenting an obstacle to progress difficult to be overcome, and placing difficulties in the way of the manufacturer obtaining further orders, which nothing but the most persevering energy, coupled with the highest degree of excellence in production, could surmount. Such was the state of affairs some ten or twelve years ago, when the proprietors of the Stamp End Works set about devoting their energies to the production of a class of portable steam-engines, combining simplicity in the arrangement of details, excellence of workmanship, and durability, in a degree that could not fail to secure a market wherever they became known. The result has been a triumphant success. Within a comparatively short period the firm of Clayton, Shuttleworth, and Co., has attained a position in the trade of which few others can boast. To those who are not aware of the extent to which steam-power has already been applied for farm purposes, it may be interesting to learn that the firm alluded to alone has manufactured upwards of 4000 steam-engines, and nearly the same number of threshing-machines, and each year an increased number of agriculturalists are found ready to adopt them. Messrs. Clayton, Shuttleworth, and Co., have just issued their revised catalogue, and from the extensive list of celebrities who have adopted their machinery, together with the fact that numerous prize medals have been awarded to them both in England and elsewhere, they would certainly seem to be worthy of consideration.

MANUFACTURE OF SHEAR-STEEL.—Steel obtained by the process of puddling, and known as puddled steel and steel-iron, is found not to answer all the purposes to which it might be applied, for want of uniformity and homogeneity; puddled steel, as well as raw steel, is, therefore, either formed into cast-steel or by refining into shear-steel. As an improvement upon this mode of manufacturing shear-steel, Mr. Wilhelm Spießhoff, of Unna, Westphalia, has patented an invention which consists in puddling puddled steel and raw steel against the action of the gas developed from the fuel, as well as against the action of atmospheric air, while the puddled or raw steel is exposed to welding heat, or the highest heat which it can stand without melting. For this purpose lumps or pieces of puddled steel, or of raw steel, are placed in retorts or vessels made of fire-proof material. He closes the opening into the retort by a lid with a slight-hole in it, and places the retort or vessel in a furnace to be heated; by preference he uses retorts of prismatic form. The lid should cover the opening into the retort as accurately as possible. The slight-hole in the lid communicates with a slight-hole in the furnace-door, so that the workman can at any time watch the steel within the re-

torts or vessels without opening the furnace-door or removing the lid of the retort. When the steel has become properly heated its surface presents a silver-like appearance, and the interior of the retort appears of a bluish-white colour. The time during which the steel is kept in this state of heat must not be too short, and cannot be too long, provided the heat be not increased to such a degree as will fuse the steel. After some time, which experience will dictate, the steel is taken out of the retort and hammered and rolled, and the result is a high-quality shear-steel, applicable for cutlery, wire-plates, and other purposes.

THE SCOTCH IRON TRADE.

[FROM OUR OWN CORRESPONDENT.]

DEC. 4.—Belief in testimony is the prehensile power by which information is collected. The ironmasters, merchants, and brokers, and all conversant with the Scotch iron trade, know, believe, and do testify, the stock of pig-iron in Scotland at the present moment is not less than 540,000 tons, exclusive of the Carron stock. It is well known the Carron Company do not return their stock; but that the trade estimate it at from 50,000 to 120,000 tons. The annual circulars issued in Scotland and England about the beginning of this year unanimously state the production in Scotland in 1860 to be 1,000,000 tons. The average number of furnaces in blast last year was 121; since Dec. last the average number is 123. The make, therefore, in 1861 is calculated between one million and twenty-thousand tons and one million and thirty-thousand tons. The local consumption and exports last year were about 900,000 tons; nobody expects they will be 930,000 tons this year.

The Board of Trade Returns show the disastrous effects of the cessation of the American trade, the effect of it upon the export iron trade is shown by the following table of the declared value of pig, bar, bolt, rod, railway, cast, and wrought-iron of all kinds from the United Kingdom in the ten months ended Oct. 31:—

	1860.	1860.	1861.
Total	£9,238,313	£9,348,177	£8,104,327
Thus showing a decrease of 1,243,850l. sterling in 1861, compared with the same period of 1860. When this remarkable diminution is taken into account it will not be surprising that the stock of pig-iron in Scotland alone should have increased this year 80,000 tons to 110,000 tons. It is of the greatest importance that accurate and correct statistics should be given of that article, which is the principal element of our commercial prosperity.			

Stocks in stores and makers' hands for Dec. 4, 1861:—

Messrs. Wm. Baird and Co., Tons	160,000	Sumner & Co., Tons	10,000
Messrs. Merry and Cunningham	60,000	Portland	5,000
Langdon	20,000	Forth and Lochelly	10,000
Caldwell and Co.	16,000	Clyde	4,000
Caldwell and Goven	20,000	Monkland	9,000
Kinnell and Dundvan	12,000	Shotts and Castle Hill	4,000
Omoa	21,000	Messrs. Connal and Co.'s stores	188,200
Almond	15,000		
Total tons			552,200

[FROM A CORRESPONDENT.]

Note of Shipments of Pig-iron from Scotland:—

For 1861, till date	Tons	555,227
For 1860, compared with same period		536,827

THE TIN TRADE.—Mr. N. Breebaart (Goll and Co., Amsterdam) under date Nov. 30, writes:—The prospect of a speedy improvement in the market for tin, expressed in our last circular, has become realised in the course of this month. American orders caused, from the beginning, a good deal of activity, and gradually all the lots offering found buyers at 70½ d. to 71 d. The market was already in a better position, but although the transactions had reached a certain importance towards the middle of the month, prices had barely been affected hitherto. From that period, however, the demand became more general. The market having been cleared already of the small parcels on hand, it required only a few speculative purchases to give to the article a decided tendency towards higher rates. Considerable sales took place from that moment, as well for export as for speculation, and the price advanced to 74 d. A few hundreds of bars were sold at 73½ d., but, generally speaking, there are no sellers at this quotation. **BANCA TINS.** 1861. 1860. 1859. The stock on warrants amounted on Oct. 31. 74,683 81,352 72,352 Deliveries in Nov. 12,655 11,288 11,341

CARVILLE MECHANICS' INSTITUTE.—On Wednesday evening, the first of the present series of winter lectures was delivered before the members and friends of the Carville Mechanics' Institute by Mr. Cooper, viewer, on "The Air we Breathe." The lecture was instructive and entertaining, and the attendance respectable. The next is to be given by the Rev. W. Saul.

GEOLOGISTS' ASSOCIATION.—On Monday (the Rev. Thomas Wiltshire, M.A., F.G.S., President, in the chair) the following papers were read:—"On two Beds of Re-deposited Crag Shells in the vicinity of Yarmouth, Norfolk," by C. B. Rose, F.G.S.; "On a Newly-discovered Outlier of the Harpateoid Strata, on the Osborne Estate, Isle of Wight," by Dr. E. T. Williams, F.G.S.; "On the Exchange of Fossils amongst the Members," by A. Both, A.A. Prof. Tennant, F.G.S., exhibited some specimens of fossil shells in Nova Scotia, and recently brought to this country. He read extracts from a report by Mr. Howe to Lord Mulgrave, the Governor of the colony, dated in Sept. last, from which it appears that although the announcement of gold discoveries in Nova Scotia, which was made in 1860, was to some extent premature, inasmuch as the gold fields then discovered did not to all appearances contain the precious metal in sufficient quantity to pay for the labour of working, yet subsequent investigation has led to the conclusion that gold does exist in the colony in very great abundance, and extensive workings are now being actually carried on there. In fact, Mr. Howe considers that Government will be justified in assuming that at all events in the places in the colony where the workings at present exist, if not in other places yet untried, gold mining will be permanently established as a very important branch of industry. Mr. Rickard exhibited of model of an ingenious machine recently patented, the object of which is to render common peat available as fuel to the same extent as coal, at a much less cost.

SCHOOL OF PRACTICAL GEOLOGY—PHYSIOLOGY.—Professor Huxley, F.R.S., delivered his seventh lecture on the above subject, on Saturday last. He resumed his observations on the eye, by considering the action of its different parts, and how light is brought in contact with the nervous expansion. He premised the nature of light, and how it is affected by other bodies. Light is held to be the vibrations of a subtle fluid, known as ether, set in motion by luminous bodies. The pencils of light, if unobstructed, are transmitted in nearly straight lines, but are refracted if they pass into a denser medium. This brought him to lenses generally, and subsequently to those of the eye. He then went to show how the rays of light, in passing through the cornea and crystalline lens, are brought to a focus at the retina. He now explained the terms spherical and chromatic aberration, and showed that the latter was owing to the different refrangibility of the rays composing the spectrum. Attention was now drawn to the action of the cornea and the crystalline lens, and how the latter was changed in outline by its attachment to the ciliary muscle. By this the process of adjustment is effected. The iris was shown to be a regulator, analogous in its functions to the tympanum in the ear. The lecturer now considered the structure of the retina, explaining the arrangement of its capillaries, ganglionic corpuscles, and its rods and cones.

THE SYMON FAULT IN THE COALBROOKDALE COAL FIELD.—A valuable paper upon this subject was recently communicated to the Geological Society, by Mr. Marcus Scott, mine surveyor, of Great George-street, Westminster; and as the author has had nearly twenty years' experience as owners' viewer and surveyor, his communication is entitled to every consideration. From a general review of all the circumstances, there can be no doubt that the Great Symon fault indicates the existence of an old valley, or estuary, of denudation of the coal and ironstone measures, in which, subsequently, other strata of the coal measures were deposited, and that these were partially washed away again. The information that he has been able to obtain, as regards the Randle and Clod Coal, south of pit (the southernmost pit in Sturbridge parish), leads him to the conclusion that the Symon fault has never entirely cut off that coal and the three coals immediately above. He believes that the working was abandoned only because the coal was a little deteriorated by denudation, and other portions of the property being at the time of the abandonment more easily worked. He finds the whole of the coals at pit (the Halesfield Pit, in Madeley parish) but slightly altered as to their relative position and thickness, with the Calamintar and the several rocks and clods above. He assumes, therefore, that there is every probability of an area of coal and ironstone being found (at least it is to be hoped so) at a workable depth in the unexplored district between the F and G pits, and possibly underneath the lower red sandstone, where hitherto none was expected by practical workers.

SOCIETY OF ENGINEERS.—The annual dinner of this society took place on Thursday evening, at Radley's Hotel, New Bridge-street. Among the guests, who numbered nearly 100, were several gentlemen of eminence in the engineering and scientific world, among others may be mentioned—Mr. Amos, the present Chairman of the society, and who ably presided upon this occasion, being supported by Mr. Christie, Mr. H. P. Stephenson, Mr. Light, the Rev. Dr. Light, Mr. Louch, Mr. E. J. Walton, Mr. F. F. Murray, &c. This society, which mainly owes its initiation, position, and advancement to the indefatigable exertions of Mr. Alfred Williams, the hon. secretary, was established in 1854, since which period it has steadily and satisfactorily progressed, at the present time numbering nearly 300 members, among whom are several who hold no mean position in the scientific community. During the year several valuable papers have been communicated, and the subjects treated being freely discussed, the members have ample opportunities of receiving and according opinions, which, to engineers, cannot fail to be of inestimable value. The society has now attained such a position as to justify a proposal for taking a suite of rooms, to be provided with all the conveniences and advantages of a club-house. Mr. Riley, F.C.S., has

been unanimously elected the Chairman of the society for the ensuing year, who will, no doubt, give as much satisfaction to the members generally as has characterised the presidential career of Mr. Amos, whose term of office expires with the present year.

ASSOCIATION OF ASSISTANT ENGINEERS, GLASGOW.—At the usual monthly meeting of members, Mr. W. R. Copland, the Chairman, introduced Mr. A. B. Ghewy, who read an able and very interesting paper "On Boring Machinery for Mining Purposes." He began by speaking of boring generally, of its antiquity, and of the various kinds of machinery employed—ultimately addressing himself to a description of a machine invented by Mr. Paton, engineer, Govan Ironworks, and now in successful operation. Of this machine a large-sized drawing was exhibited, as well as a model of the ordinary boring machine. The paper was listened to with marked attention, and elicited some warm discussion. Mr. Alex. Russell next submitted the model of a machine for cutting iron for tubes, and gave a description of its *modus operandi*, as well as a practical demonstration on some pieces of tin. Several questions asked by members were satisfactorily answered by Mr. Russell.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

DEC. 5.—The Iron Trade keeps quieter than it was a month ago. It does not appear that this in any degree arises from the events which have rendered war with the Federal States of North America a possibility, although it is hoped that it may be avoided. So far as the immediate effect of such a war on the Iron and Hardware Trades is concerned, it would probably be rather to increase than to diminish the demand. Naval requirements would at once operate, whilst shot and shell, and a variety of appliances would quicken operations at the foundries and other works. Again, a war with the Federal States would be speedily followed by the opening of the ports of the Confederate States, and that cotton, for the want of which short time is being worked in Lancashire, which necessarily greatly diminishes the demand for iron and hardwares in that populous and wealthy district, would be released. Of course war would be a terrible calamity, and every right sentiment urges its avoidance if possible; but so far as South Staffordshire is concerned, the demand for its productions would suffer but little.

In the Naval and Military Intelligence of the *Times* it has been stated with constant reiteration that the dockyard authorities at Chatham have had to reject a large quantity of iron, owing to its being unequal to the Government requirements, and it is added that the Admiralty find it impossible to procure good iron for the purpose. To everyone acquainted with the trade this statement must at once appear absurd. It is a sufficient answer to it to say that the eminent shipbuilding firms on the Thames and the Mersey find no difficulty whatever in obtaining iron for the construction of the iron-plated vessels which they are building for Government. The iron they use is subjected to precisely the same tests as that used in the Government dockyards, and the test is applied by Government officers. A large quantity of iron for these firms is produced in South Staffordshire, and not a single hundredweight has ever been returned; on the contrary, special approval has been expressed respecting it. Yet parties from whom the contractors purchase have tendered to supply Government, but their tenders were declined, no doubt because lower prices were offered. The result is that the Government, in trying to save, perhaps, 10s. or 12. per ton, lose an immense amount by the stoppage of their operations, to say nothing of the possibility that part of the inferior iron may have been used, and may deteriorate from the value of the vessel. It is not because the Admiralty authorities are so remarkably economical that they have thus accepted low tenders, and got inferior iron. As an illustration, take the fact that the ordinary contract for the dockyards for the supply of iron, and which applies to a very large quantity annually, is taken for three years. At the end of that period it is subject to being terminated by either party. It was last offered at the close of 1856, and was liable to be closed in 1859. At that time the official price of iron was 30s. per ton less than when the contract was made, yet the Government allowed a new three years' extension to be given to it. Since then a further reduction of 10s. has taken place, so that the country is paying 22. per ton above the market price for iron used at all the dockyards in the kingdom, which would amount to an enormous sum.

At a colliery at Tipton, last week, a young man who was ascending the shaft with three others, from some unexplained cause, fell out of the skip, and was killed. He was to be married at Christmas, and was working extra hard to gain a little more money; and it is thought that he was exhausted and turned giddy, as he had done a day and three-quarters work that day. At the inquest Mr. Baker, the Government Inspector, observed that many accidents of this nature occur, and he advised that a small chain attached at the top to the rope, or chain, should be put round the body of each man ascending or descending, which would cost very little, and might be very readily applied. Mr. Baker said he always used one himself, and that they were being gradually adopted in the district.

REPORT FROM YORKSHIRE, DERBYSHIRE, AND LANCASHIRE.

DEC. 5.—The prospects of a brush with America has created considerable excitement amongst commercial men, and all sorts of opinions are speculated upon the probable result. The effect of the intelligence has not disturbed the steadiness which has characterised the Iron Trade for the last three weeks, and the demand for all descriptions is somewhat improved for first-class brands. The inferior makes of iron are slow of sale, and manufacturers have to accept lower prices. The Steel and Hardware Trades of Sheffield are in a deplorable state, and a great number of persons are out of employment. The pressed condition of the cotton trade has also produced great distress throughout Lancashire; and it is calculated, on good authority, that by the end of the year one-half of the operatives will be out of work. The Coal Trade has improved throughout the whole of these counties, but the consumption is far short of the average of former years. The South Yorkshire coalowners, after a long series of struggles, have just achieved a triumph in the free trade principle, which will rapidly improve the trade of the district. It is well known that the Manchester, Sheffield, and Lincolnshire Railway Company have been considerable as well as carriers, and that for the last two years a case has been pending to restrain the company, as carriers, from trafficking in coal as merchants. The company have now agreed to give up their traffic in coal as traders, and to confine themselves to their more legitimate trade of carriers. The coal depots on the line are to let, and the coal trade of South Yorkshire will henceforth be free to the legitimate coal-master. The company had with their contract with the Birley Vale Company 1450 coal wagons, which will now be placed in the service of the coalowners, so that the complaints of the scarcity of wagons will now be done away with.

A deputation of Sheffield tradesmen waited upon the Midland Railway Directors, on Monday last, for the purpose of pointing out the most desirable route for the intended new railway, which is to do so much for the development of the minerals of North Derbyshire, and be of such great service to the town of Sheffield. It was urged that there ought to be a mineral station on the Sheffield Moor, and that the line should be made down the valley of the Sheaf, so as to accommodate the numerous works in that locality. They contended that these views adopted three objects would be attained—namely, a central passenger station, a mineral station near the principal works, and accommodation to a vast population. It was calculated that the works already built consumed 130,000 tons of coal and coke per year, and that there were 25,000 dwelling-houses in the district, which consumed 120,000 tons of coal per annum. The Midland Company promised their best attention to the suggestions. The Midland dividend for the current half-year is to be at the rate of 7 per cent., which is mainly attributable to the increase in the mineral traffic.

The half-yearly meeting of the Egm Mining Company was held on Friday, when a report and statement of accounts were read, which were considered highly satisfactory. The company had paid four 10s. dividends during the half-year, and had about 1400l. in the bank as a reserve fund. A large amount of dead work had been done, but the mine was in an improving position. The Mill Dam Company are getting a large quantity of ore, and the mine was never in a more promising position. The North Derbyshire is still in the unsatisfactory state we last noticed it. The other mines do not call for special remark. The share market, with one or two exceptions, is flat.

REPORT FROM MONMOUTH AND SOUTH WALES.

DEC. 5.—The American difficulty, and its probable effects upon the trade of the district, have been the chief topics of interest during the last few days. As yet trade has not been affected in this neighbourhood, but, on the contrary, the demand for coal seems to be increasing. There are a larger number of vessels waiting for cargoes at Cardiff than has been the case for some time. These vessels are principally bound to the Mediterranean and the French ports, and are almost exclusively engaged in the coal trade. At Newport things wear an improving aspect, and a fair business is doing. The Ebbw Vale Works are progressing steadily, and Mr. Darby, the managing director, who has recently taken up his residence at Ebbw Vale Park, is making considerable alterations in nearly every branch of the company's extensive works.

At the Merthyr Police Court, on Saturday, before Mr. Fowler, the stipendiary magistrate, Mary McCarthy and Julia McCarthy were charged with stealing 192 lbs. of coal, the property of the Dowdalls Company. The case was clearly proved against both prisoners, and they were committed for ten days each.—William Edwards was brought before the same magistrate, on Monday, charged with stealing 3 cwt. of coal, the property of the Dowdalls Company. The prisoner is the owner of some property in Dowdalls, and the case excited considerable interest. Mr. Simons appeared for him. Police constable Jenkins said—"On Thursday last, about three o'clock, I saw Edwards at the bottom of the tip, near Cwmbargead Pit, with a horse and two paniers. He was filling coal into the paniers. I charged him with stealing the coal. There is a notice painted on a piece of sheet-iron, prohibiting parties taking anything off the tip. Cross-examined by Mr. Simons: The refuse of the works is thrown on the tip. There is not a quantity of the coal carried to a distance by water. It was all clean coal, and there was no part of it burnt. Prisoner came from the direction of Rhymney. Did not know that he had been there that day. Did not know him. Did not know that he was a farmer, and the owner of a farm. Have since heard he is. Did not know that he kept a pack of hounds.—Mr. Simons, in an able address, urged on his worship that there was no proof of a felonious intent. It was taken publicly, in broad daylight, in the presence of a police constable, and while the men were at work on the tip. He should contend that it was

not the property of G. T. Clarke, it not having been weighed; there was no royalty paid, consequently it was either abandoned waste, or the property of the lord of the manor. It was perfectly useless, and would be more expensive to gather it than its value, hence for years no attempt had been made to prevent any one taking it, and the stream of water running at the bottom of the tip sometimes carried it a considerable distance, it being lighter than the ironstone. This was the origin of the coal trade of the town of Newport. The coal crop being so near the surface was loosened by the flood and carried down by the river Usk, in such quantities as to supply the whole neighbourhood, and many cartons were also sent off at the commencement of the ironworks in the neighbourhood, who got their supply in the same manner. When that failed, they adopted the scouring system, guiding their large ponds of water on to the coal beds, for the purpose of loosening it. The learned advocate then contended that the prisoner had a right of common, and as such, a right to any deposit on the surface. He then called several respectable farmers, who deposed to their having a right of common; that they had been in the habit of using the refuse from the tips for many years without let or hindrance. He then further contended that there was no felonious act, if it were trespass. Let the Dowries Company enter an action for the purpose of trying the question. This extraordinary and ingenious defence took the Court by surprise, and Mr. Fowler said, if Mr. Simon's statements were correct, it was of vital importance to the owners of mines, who had to deposit large quantities on the surface. He could not see it, however, in the same light, but would consider the matter, and for that purpose would remand the prisoner until Saturday, on his own recognisance.

At the South Wales Institute of Engineers next meeting, on Wednesday, Mr. R. Schmidt's paper, read at the last meeting, "On Prof. Zenger's diagram for showing the motion of the slide valve," will be discussed, and the following papers read and discussed:— "On the sanitary condition of mines," by Mark Fryar. "On the Pembrokehire Coal Field," by Mr. A. Murray. "On a plan to improve canal locks, and to render canal railways less costly," by Mr. G. Ashcroft. "On Giffard's Injector," by Mr. T. D. Steel. At the Swansea Police Court, on Tuesday, William Newton was charged with having stolen a quantity of copper, value 10s., the property of Messrs. Grenfell and Co., Upper Bank Works, Llanmihet. Mr. Lefaux, one of the agents, found some copper secured behind a pillar in a shed on the works. The prisoner was suspected, and one of the men was put to watch the copper. The prisoner was seen going into the shed, and immediately afterwards the copper was missed. A constable searched the prisoner, and found the copper secured in his clothes. Newton pleaded guilty to the charge, and he was committed for three months with hard labour.

The iron and coal works are fairly employed throughout the district. In the *Mining Journal* of last week it was stated that there was every probability of an additional furnace being blown in at the Gadlys Works, Aberdare. This welcome event has now taken place, and employment is thereby afforded to at least 500 men.

The arrivals at Swansea include—the Peru, from Caldera, with 3712 bags of silver ore, weighing 250 tons, value 15,000l., and 300 tons of copper regulus, for Henry Bath and Son; Rose of England, from Caldera, with 2155 bags of silver ore, weighing 150 tons, value 8500l., 44 tons of copper ore, and 400 tons of copper regulus, for Henry Bath and Son; Mohican, from Caldera, with 340 tons of copper regulus, 537 bags of silver ore, weighing 45 tons, value 3900l., 113 tons of argentiferous ore, one box containing 2 cwts. of lead ore, &c., for Henry Bath and Son; Hampshire, from Cuba, with 770 tons of copper ore, for the Coburn Company; Ariel, from Honkelp Bay, with 290 tons of copper ore, for Henry Bath and Son; Havannah, from Havannah, with 193 tons of copper ore, for Henry Bath and Son.

Meetings of Mining Companies.

GREAT BRIGAN MINING COMPANY.

A general meeting of proprietors was held at the company's offices, Austinfrirs, on Thursday, Mr. Eves in the chair.

The notice convening the meeting having been read, the minutes of the last were read and confirmed. The accounts showed:—

Balance last audit	£1166 13 10
May mine cost, merchants' bills, &c.	522 6 5
June ditto	400 13 10
July ditto	433 14 2
August ditto	334 17 11
September ditto	301 13 11
October ditto	299 0 0
Dues	31 3 2 = £6490 3 3
Call	£4250 0 0
Copper ore sold	812 15 9 = 5062 15 9

Leaving debit balance.....£1427 7 6

The report of the agent, Capt. T. Trelease, was read, as follows:—
Dec. 3.—In handing you my report of this mine for the general meeting, I beg to inform you, more particularly the new adventures, that we have created a new 70-inch pumping-engine of the first-class complete, in good working order, of sufficient power to drain the mine to the bottom (which is reported to be about 60 fms. below the adit), and sink the mine, say, 80 fms. below the present bottom; we have also 17 fathoms of 18-in. pumps on the mine for dropping below the adit, with the house water-lift, rods, &c., and everything complete, and in good working order, with the bearer put in for the drop-lift, and the engine shaft cleared 9 fms. 3 feet below the adit level. This level is cleared, secured, and laundered throughout the set for the discharge of the water, and we are now in a good position to drain the south part of the mine, on the Old Brigian lode, which appears, from what can be seen in the adit level, to have been worked very extensively, as the greater portion of the lode has been taken away at and about this level for upwards of 100 fms. in length, and judging from this, with the beautiful strata and elvan course running parallel with the lode to the south, and the comparatively shallow depth this has been wrought upon, it is a speculation of no ordinary character, besides having a tin lode a few fathoms to the north, running parallel, which the old workers appear to have taken but little notice of, it being only cross-cut about the engine-shaft, which is from 2 to 3 feet wide, composed principally of capels, and showing a small portion of tin. About 40 fathoms west of this part it fell in with the Old Brigian lode, where it made a small bunch of tin, and we have now at surface about 300. worth of tin-stuff; this clearly shows it is a tin-bearing lode, and when laid open in deeper levels we have reason to expect it will prove profitable and productive. Middle Lode: This lode stands about 75 fathoms to the north of the tin lode, the deep adit cross-cut passed through it, and a shaft sunk from the surface on its course, also opened on west of said shaft about 16 fms. This lode is about 15 in. wide, composed of quartz and capel, with stones of copper ore, and appears, from what can be seen at present, to be almost entirely in unexplored ground for the whole length of the set, and which, in course of time, we shall have to develop. North Trekerby Lode: This lode stands 60 fms. north of the above lode, and is intersected by the same cross-cut, and we have opened east on its course 20 fms. This lode in the first 15 fms. averaged from 2 to 3 feet wide, containing some very good stones of copper ore, which on assay produced 35½ per cent. of copper; since then the lode has been rather small, and split into branches. In driving west of the said cross-cut we have opened 16 fms., the lode for the whole of this driving has averaged from 2½ to 3 feet wide, carrying a small quantity of copper ore for the whole distance, and still producing some very good stones of ore of a promising appearance, and from indications I am firmly of opinion that when explored to deeper levels it will improve, and produce a quantity of ore. At Oate's shaft, which is 48 fms. west, we have intersected this lode near the cross-course, and there it is apparently by the influence of the cross-course split into branches, and there is no doubt, when getting clear of the disordered ground, that the lode will again resume its regularity. I beg to remind you that this part of the set, on the course of this and the other north lodes, is entirely in virgin ground up to the country cross-course, which is 400 fathoms long, and looking at the geological position of the surface, I consider it to be one of the most promising parts of the set. The trial shaft is now being sunk by nine men on the course of this lode, 8 fms. 3 feet below the shallow adit level; the lode at present is from 4 to 5 feet wide, and worth about 12½ per fm., and likely to improve, having got clear of the slide which disordered the lode for several fathoms sinking. Our progress in sinking this shaft has been very much impeded in consequence of the rain, from which we have been under the necessity of putting down a 6-in. lift, which is now worked by horse-power. However, this appears to be a very promising lode indeed, having returned upwards of 7000l. worth of copper ore before even reaching the deep adit level, with an expenditure of a little over 10000l.; this alone is quite sufficient to warrant a spirited trial on this part of the set, and especially when it is known that the lode has not been developed at any part of the set below the deep adit. Whip shaft is sunk 9 fathoms below the shallow adit level, and intersected this lode, but now suspended; owing to the influx of water we could not see enough of the lode to ascertain its size and character, but hope soon to resume the sinking, as it will be drained by the sinking of trial shaft, and driving the deep adit level towards it. Trevenning's lode stands about 25 fms. to the north of North Trekerby lode, and underlies south about 3 feet per fathom; this lode produced a good deal of ore in the back, and will intersect North Trekerby lode about 30 fms. below the deep adit level, when favourable results may be looked for. With regard to forking the deep adit level, the mine in conjunction with the Great North Downs, I have carefully considered the matter, and I calculate it will take from nine to twelve months to drain, clear up, and put the mine in good working order, say, with an expenditure of not less than 8000l. per month, to carry out all the operations that may be required throughout the mine; the returns of ore that will be made I have every reason to believe will greatly reduce the amount required. In conclusion, I beg to say, looking at the local position of the mine, with the different lodes, cross-courses, strata, and elvans, traversing the set, and situated near the granite hill, it is my opinion, with many other practical men, that the mine will not fail to prove a lasting and profitable concern.

The CHAIRMAN, having moved the adoption of the report and accounts, said they had passed through some difficulties, all of which he was happy to say had been surmounted or arranged, and from the report of Capt. Trelease, which had just been submitted, he (the Chairman) thought they had every reason to believe that Great Brigian would prove to be a remunerative property. It was satisfactory to hear that the Great North Downs Mine was about to be vigorously prosecuted, because he thought there could be no doubt that by working that set not only would its proprietors be rewarded for their outlay, but that they, the Great Brigian proprietors, would also be benefited by materially reducing their water charges. He trusted the shareholders in both mines would during the next 12 months be rewarded for their perseverance and outlay.

The PURSER, referring to the prospects of the mine, said it would be seen by the section that the North Trekerby portion of their set was of great promise. The returns from that point had already amounted to 8200l., the whole of which had been raised from workings not deeper than 25 fathoms from surface. The trial shaft was sinking close to the boundary of North Trekerby, and North Trekerby was sinking a similar shaft close to the Brigian boundary, and in each mine a valuable lode was being developed. The deep adit was being forced on by a full pair of men, in order to reach the bunch of ore, and from every indication there was reason to hope they would lay open a valuable run of ore ground.

Capt. TRELEASE explained the various points of operation by means of a section, stating that it was the opinion of everyone who knew anything about the property, and in that opinion he most fully concurred, that a judicious and vigorous development would result in a remunerative issue. In answer to questions, he further stated that the Great North Downs engine would fork the water at Great Brigian to at least 15 or 20 fms. below adit, and that he would be able to clear the shaft at Great Brigian quite as rapidly as the engine at Great North Downs could fork the water. He strongly recommended the three mines, Great Brigian, North Downs, and Wheel Rose, to divide their water charges, for by that arrangement each would reap a material advantage.

The report and accounts were then received and adopted. The CHAIRMAN said the next point had reference to their finances. Deducting the arrears of call, to recover which measures must be forthwith adopted, there remained a deficit of something like 14000l. Now, he understood it was thought that the best course they could adopt would be to make a *pro rata* distribution of that amount, being, in fact, a division of the costs, which would amount to a call of 5s. 9d. per share.

Mr. F. PYNOR, fully concurring in the views of the Chairman.

After some discussion, upon the proposition of Dr. MATHEW, seconded by Mr. F. PYNOR, a resolution was passed dividing the back costs, giving a *pro rata* call of 5s. 9d.

per share, when a resolution was passed empowering the purser to take proceedings against all shareholders in arrears of call.

The PURSER said the next matter which had to be submitted had reference to the subject of the water charges, as already referred to by the Chairman. The resolution was to the effect that the committee be empowered to make such arrangements with the adjoining mines in respect to the water charges as they might deem necessary.

Dr. MATHEW having proposed the motion, during which he referred to the great mutual advantage which must necessarily result from the carrying out of such an arrangement, Mr. F. PYNOR seconded the proposition. He assured the proprietors he did not know any mine in the county of Cornwall that presented such chances of success as Great Brigian. He felt quite confident if the whole of the details were carried out judiciously and economically, and especially the proposed arrangements with regard to the water charges, that Great Brigian would ultimately prove to be a most valuable property; in support of which opinion, the best evidence he could adduce was the large interest he himself held in the company. The resolution, being put, was carried unanimously.

The CHAIRMAN said since the last meeting the committee had appointed Mr. E. King to fill the office of purser, whom no person could be better qualified, but that appointment required the confirmation of the shareholders at a general meeting.

Mr. F. PYNOR would esteem it a great favour if he were permitted to propose a resolution confirming the appointment of Mr. Edward King as purser of the Great Brigian Company, for he must say he did not know any one better qualified to efficiently discharge the multifarious duties which pertain to the office of purser of a mining company than Mr. Edward King. Perhaps there were few persons who had better opportunities of judging of the peculiar capacities possessed by pursers than he (Mr. Pynor) had, and it was with the greatest pleasure that he bore testimony to the vigilance, ability, and perseverance which had so strikingly characterized Mr. E. King's career as mining secretary or purser. Although Mr. King had been connected with the Great Brigian but a short period, yet he had already done a great deal for them in dissipating the difficulties which had retarded their progress. Mr. King had, to his (Mr. Pynor's) mind, satisfactorily adjusted the whole of the difficulties, and the arrangements contemplated with regard to the Great Wheel Busy, Great North Downs, and Great Brigian would, he was confident, produce most satisfactory results to each of the respective properties. Under those circumstances, it was with no small pleasure that he proposed the confirmation of the appointment of Mr. E. King, as purser, and also that the best thanks of the meeting be accorded to him for the prompt manner in which he had brought about an amicable arrangement of all the pre-existing difficulties, and also for the successful plan which he had consummated in connection with water charges of the adjoining properties. Mr. McALLAN fully concurring in the views expressed by Mr. F. Pynor, had much pleasure in seconding the proposition.

The CHAIRMAN, in putting the resolution to the meeting, most cordially agreed in the encomiums passed upon Mr. King, and trusted that success would soon attend their united co-operation. The resolution being put was carried unanimously.

A resolution was then unanimously passed, according to Mr. Gostley, the late purser, the best thanks of the proprietors.

Messrs. Ives, Pinniger, F. Pynor, McAllan, Hunter, Harvey, and Dr. Mathew were appointed the committee of management.

A vote of thanks was then passed, when the proceedings terminated.

GREAT NORTH DOWNS MINING COMPANY.

A preliminary meeting of the promoters and others interested in the formation of this company (to which attention was drawn in last week's *Journal*), was held at the company's offices, Austinfrirs, on Wednesday, Mr. J. PINKINGTON in the chair.

Mr. EDWARD KING having submitted a list of shareholders, which showed that nearly all of the shares (5000) into which the enterprise has been divided had been accepted.

The CHAIRMAN said that all present were undoubtedly aware of the object for which the present meeting had been convened—taking the necessary steps for the formation of a company for the purchase and development of a property hitherto known as the North Downs and Wheel Rose, the operations of which, after an expenditure of 18,000l., were suspended, from various causes in no way connected with the value of the property. But, irrespective of the fact that the set was very valuable, and that in past years it yielded large profits, the resumption of operations at North Downs and Wheel Rose, as at the Brigian Mine, would materially aid the operations at Great Wheel Busy by relieving the water charges, and thus considerably reduce the working cost. Being himself a large shareholder in Great Wheel Busy, and knowing that Mr. E. King had recently purchased the before-named property, he had recently visited Cornwall, for the purpose of investigating the whole of the matter, to ascertain what were the prospective results of re-working the Great North Downs, and also the advantages that were likely to accrue to Great Wheel Busy. From all the information he could obtain from practical and other sources, the conclusion he had come to was that the Great North Downs Mine presented features of great promise. He based that opinion upon the fact that the mine, which had been explored to a depth only of 50 fathoms, contained no less than eleven copper lodes, most of which had been wrought on above the adit level; that it was situated in one of the best mineral districts in the county, that its intrinsic value had been satisfactorily tested, and that the re-working of the property must necessarily have a material and permanent effect upon the operations at Great Wheel Busy, by considerably diminishing the water charges, which would not only enable them to develop the mine much more expeditiously, but they would be placed in a position to make increased returns at a more moderate cost, and thus permanently augment the profits. Under those circumstances, he had taken a large interest in the Great North Downs Mine, and strongly recommended the meeting to follow his example, and to determine to forthwith vigorously proceed with the development of the property.

Mr. FIELDING fully concurred in the opinion just expressed by their Chairman, having himself recently visited the mine, and entered minutely into the whole of the details connected therewith. If at the present meeting a call of 1l. per share was made upon the 5000 shares into which the undertaking had been divided, 10s. to be paid down, and 10s. upon April 1, 1862, a sufficient sum would be realised for the purchase of the whole of the plant, machinery, &c., and also to carry on the operations for the next six months.

A PROPRIETOR stated that he recently conversed with the late manager of the Great North Downs Mine, from whom he had ascertained such facts as had induced him to come to the conclusion that the property presented various points of promise, equal to any mining property in the county; and that, after the large but economical expenditure that had been made upon the property, and providing it with machinery, it only required a very small outlay to bring the property into an efficient working condition. The large quantity of copper that had been raised from above the adit level proved that the lodes were most productive; and for his part he saw no reason why a mine which had returned so much at such a shallow depth should not, upon reaching the second bunch of ore, be more productive than in the former working. The great drawback to the continued successful development of this property had been the excessive water-charges, but seeing that Great Wheel Busy, to the east, was in full course of profitable operation, that Wheel Rose was about to be provided with a 70-in. engine, and that the Brigian Mine had already a 70-in. engine at work, it was palpable that the water charges being thus divided among so many sets, each pumping-engine would have but a moderate amount of duty to perform, and thereby the working cost of each would be diminished, and at the same time the respective properties could be much more expeditiously developed. He looked forward to having a productive mine in 12 months time.

As, being agreed that a call of 20s. per share upon the 5000 shares of the company should be made, 10s. to be paid down, and 10s. upon April 1, a resolution was then passed empowering the committee to make such arrangements with the adjoining mines with respect to the water charges, as they may deem necessary.

Mr. EDWARD KING said that the next step was the appointment of the agents. Several applications had been made, which were submitted to the meeting. Upon this subject a long discussion ensued, during which it was intimated that Capt. Trelease, the managing agent at Brigian Mine, was well qualified to conduct the operations of both mines. A resolution was accordingly agreed upon that Capt. Trelease should be appointed the manager of the mine, Captain Martin Jenkins appointed underground agent, and Mr. Moses Burden, Great Wheel Busy Mine, superintending clerk.

Dr. MATHEW considered that the prospects of the mine were such as to warrant a spirited trial. He reminded the meeting that each person who took a 1l. share would have the benefit of an expenditure of 18,000l. He trusted, after the resolutions which had been passed that day, the 80-inch pumping-engine would be got to work immediately.

Mr. E. KING said the mine was provided with a large quantity of machinery, having, besides an 80-inch engine, a good drawing-engine and crusher, and about 100 fathoms of large pitwork, whims, &c.—in fact, all the plant of an extensive mine. When formerly worked it had given upwards of 200,0000l. profit, and the mine was not developed below the 50 fathom level. It has been proved, which was making dividends; therefore, he saw no reason why Great North Downs should not be equally successful as it had been in past times.

The following appointments were then made:—Mr. E. King, as purser; Messrs. Loam and Sons, engineers; Messrs. G. A. and T. Mitchell, surgeons; Messrs. Williams and Co., Miners' Bank, Truro, were appointed the company's bankers.

The following gentlemen were appointed the committee of management:—Messrs. Pinniger, E. Bridges Williams, E. Hunter, J. Fielding, and Dr. Mathew. The usual complimentary votes terminated the proceedings.

ST. DAY UNITED MINING COMPANY.

A general meeting of proprietors was held at the company's offices, Austinfrirs, on Tuesday, Mr. J. BALTER in the chair.

Mr. E. KING (the secretary) read the notice convening the meeting, and the minutes of the last were read and confirmed.

The accounts for the four months, ending Aug., showed:—

Call	£2000 0 0
Copper ore sold	1365 4 4
Tin ditto	7702 6 4
Arsenic	100 0 0
Stamps rent	89 12 0
Old materials	133 13 1 = £11,390 15 9
Balance last audit	£1444 19 11
May mine cost, merchants' bills, &c.	2249 15 0
June ditto	2282 6 7
July ditto	2552 11 6
Aug. ditto	2434 5 4 = 10,913 18 4

Leaving credit balance.....£ 476 17 5

Upon the four months' operations there was a loss of 78l. 2s. 8d.

The report of the agent was read, as follows:—

Nov. 30.—The 114, at Wheel Unity, west of Davie's shaft, on the old lode, is now producing fine stones of ore, with a very kindly appearance; we are induced to believe that we shall open up some valuable ground in this part of our mine, as there is no level the ore presents to the eye. The lode in the wing sinking below this level is 6 feet wide, and is presenting very good appearances, and worth 100l. per fm. We have commenced driving the 124, which is within 8 fathoms of the above winze; the lode in this level is also producing fine stones of ore. We look forward with much interest to the development of this part of the mine, and looking at the recent change in the appearance of the lode we have every reason to expect good results.—Folclice: Trussall's North Copper Lode: The 162, west of shaft, will produce 1 ton of ore per fm. The 144 east is also worth 1 ton per fm. The lode in the 114, west of Trevelian's, is worth fully 100l. per fathom for tin. The lode in the 153, west of Biscoe Pool, will produce 3 tons of good ore per fm. We have frequently referred to the importance of this level, the same being going back under the shaft. The 162, west of shaft, has produced very large quantities of ore; this end has let down the water, so as to enable us to commence winzes in the level above after it is cleared. The 162, west of shaft, is producing good stones of ore; in driving this end about 3 fms. further we shall reach some ore ground gone down in the level above; this end is not so far west as the 153 by 40 fms. Billing's shaft is now sinking below the 164, and is worth full 70l. per fm. The 164 is extended 9 fms. east of shaft, and is worth full 55l. per fm. The 164 is extended west of shaft 7 fms.; lode worth 40l. per fm. The slopes in the back of this level (the 164) are worth 45l. per fathom. The 154, east of shaft, is producing saving work for tin; this end has gone

through a valuable place of ground for 45 fms. in length. The 154 is extended west of shaft 30 fms., and up to the last 7 fms. the lode has been better than it is now; I think it right, however, to mention in driving this level within 7 fms. of the present end the lode split, and at this time the part we have driven on is, and has been, poor. We commenced a cross-cut south, and have just cut the other part of the lode, but have not yet seen the south wall, but from what we have seen of it it is worth 15l. per fathom. In order to further prove the value of this part of the lode, which we have not seen much of, we have commenced to sink a winze on it, and is worth full 20l. per fm.; this winze is down 9 fms. The slope in the 154, east of winze, is worth 18l. per fm. The rise in the back of the 154, east of Billing's, to make Opie's shaft, is worth for length of shaft 24l. per fm. From this you will observe that the new Opie's shaft will come down in its proper place, thus proving the views we submitted to you in our last report for the meeting to be correct, and we may as well add that this shaft will be commenced below this level in a beautiful channel of ground, and in a fine course of tin. We estimate this shaft can be sunk as the permanent sump-shaft for 14l. per fathom—that is until we get below Billing's shaft. We are getting on very rapidly with the completion of Opie's shaft, and will be done in the time we estimated. We are also getting on as fast as the weather will admit of in building the engine-house, and in doing every other necessary work for the new engine. From this report you will observe our prospects for tin are very good, and should our prospects for copper brighten up a little we shall very soon be in a much better position, and from present appearances we have every reason to expect it will. As a proof of the value of our tin discoveries in the bottom of the mine we have sold this month nearly 40 tons of tin, and had we been able to burn it we should have sold 45 tons. Our pitches throughout the mine are much the same as for some time past.—F. PYNOR, E. RALPH, J. COCK, J. GILBERT.

The CHAIRMAN, in moving the adoption of the report and accounts, stated that he had recently visited the mine, and was much pleased with the general prospects presented. The returns of the present month had been nearly 40 tons of tin, and as it had been seen by the report of Mr. Pynor, just read, there were many points of operation which presented very encouraging features. As the committee of management held one-third of the company's shares, proprietors might rest perfectly satisfied they would continue to sedulously promote the best interests of the company. Mr. Pynor, their manager, was present, who would be glad to afford any information that shareholders might desire.

A PROPRIETOR enquired if Mr. Pynor attached much importance to the discovery recently made in Wheel Unity?—Mr. PYNOR replied that he considered the discovery at Wheel Unity a most important point, as it opened up an entirely new feature in connection with their own property. In sinking the winze below the 114 they had found the lode to be worth 10l. per fm., and presented every indication of a great improvement. The 124 was within 8 fms. of this point, where a great change had taken place in the character of the lode—indeed, there was every indication to justify the assumption that they were in the neighbourhood of a second deposit of ore. If such should prove to be the case, the 134 fm. level would be at once brought on, and Davy's shaft set to sink from the 124 to the 134. Whether it was a shoot of ore dipping west from Todpool, or whether it was the course of ore coming down from South Gorland, it was at present impossible to say, but he was most certainly inclined to the belief that the latter would prove to be the case; if so, their future samplings of copper would greatly increase. It was of the greater importance, inasmuch as that part of the mine had hitherto been a drag upon the company, their profits having been made from the tin ground. Had tin maintained its price, their accounts would have stood something like 10000l. or 12000l. better; but all they wanted was an improvement in their copper returns to bring them to the profitable position which some time since they occupied. The mine, generally speaking, never presented more encouraging features; the bottom of the mine especially looked remarkably well.

The CHAIRMAN considered the improvement near the 114 fm. level a most important point, as it gave them ground for hoping that their copper returns, which had lately fallen off, would soon be increased to their former magnitude.

A PROPRIETOR enquired the distance between the 153 west of Biscoe Pool and Hoppey's shaft?—Mr. PYNOR replied about 100 fms., but in parallel ground. It was in the lode at Biscoe Pool that the Messrs. Williams placed more confidence than in any other part of the mine. At the time of the next meeting he thought they would have accomplished three or four important objects, which would place their affairs in a much more satisfactory position than at present.

Mr. JAMES enquired if there was any probability of a diminished expenditure?—Mr. PYNOR said that their expenditure had of late been increased by much necessary new work that had to be performed, such as putting up new engine, &c. When, however, that engine was fairly at work, there would be a large quantity of spare materials to dispose of, for they would no longer require the engine at Trussall's, and the month's cost would be less.

The CHAIRMAN regarded that as a fact of twofold importance, for they would not only have the engine and materials as an available asset, but at the same time their coal of coal would be materially diminished.

The report was then received and adopted, and the accounts passed and allowed.

The SECRETARY, in answer to a question, stated that several local shareholders had recently increased their interest in the undertaking.

The committee of management were re-elected, with thanks for past services.

The CHAIRMAN, on behalf of the committee, having thanked the shareholders for their renewed mark of confidence, the usual courtesy to the Chairman was accorded, which terminated the proceedings.

COIAPAO EXTENSION (PABELLON AND CHANARCILLO) RAILWAY COMPANY.

The ordinary half-yearly meeting of proprietors was held at the company's offices, New Broad-street, on Nov. 29, Mr. J. LABOUCHE in the chair.

Mr. E. J. COLE (the secretary) read the notice convening the meeting, and submitted the report of the directors (an abstract of which appeared in last week's *Journal*).

It informed the proprietors that the second locomotive (named the Chanarcillo) had arrived shortly after the last meeting. With the valuable assistance rendered by the engineer of the Copiapo Railway Company the locomotives were speedily put together, and the result of their working had been eminently successful. The silver mines were improving, and an important addition will immediately take place in the traffic, by the opening up of the copper mines in the Castillo district. A requisition had been sent in by one of the miners for cars to transport 4000 quintals monthly, and the director in charge writes, under date, Sept. 18—"Other mines at Castillo are looking up. In July and August we, the former, 327½, and in the latter 288½, 11s. 10d. The traffic receipts show the amount earned on the six months ending June 30 to be 5708l. 18s. 5d.

The CHAIRMAN, in moving the adoption of the report and accounts, alluded to the fact that although their receipts were not yet what could have been wished, yet they evinced a steady progress, and that from the advices received by the last mail they had every reason to expect they would still further materially improve. As the traffic of their line depended to a very great extent upon the transit of the vast mineral resources of the mines, it could not fail to be satisfactory to find that the produce of the Castillo copper mines was giving continual traffic to the line, and they expected a considerable accession of traffic from the silver mines, as some of the principal presented most marked features of improvement. He thought their prospects were of a very favourable character.

Mr. WILKINSON seconded the motion for the adoption of the report and accounts.

Mr. POTYDER drew attention to an item in the balance-sheet for "road repairs." He wanted to know whether the permanent way was or was not equal to the traffic that was likely to be conveyed along its line?

Mr. E. WOODS (the consulting engineer) explained that the road was originally constructed for mule traffic, but after some experience it was found necessary, from the great expense they incurred to displace the mules by the employment of locomotive engines. Accordingly two locomotives were sent out, which necessitated a considerable permanent way. That had, of course, increased the expenses very considerably, but as the traffic increased the ratio of expenses, compared with the receipts, would be materially lessened. The company had also up to the present time been put to a considerable additional expense from not having proper workshops of their own; but the directors had decided upon sending out—indeed, they had already sent out—a steam-engine, a quantity of tools, and all other appurtenances necessary for the opening of a proper repairing-shop of their own, by which a material saving would be effected.

The CHAIRMAN said up to the present time the locomotives had performed their duties very satisfactorily, but the directors thought it might be necessary to have a third locomotive, to be kept in reserve in case of an accident to either of the locomotives that were regularly engaged in the transmission of the traffic.

Mr. E. WOODS quite agreed with the Chairman that it would be expedient to have a third engine, to be kept in reserve. Two engines were quite sufficient to do the work. The quantity of mineral each engine conveyed per journey was between 50 and 60 tons, in addition to which there was a comparatively limited passenger traffic.

Mr. POTYDER enquired if the existing locomotives would be equal to the expected increased traffic?—Mr. WHEELWRIGHT replied that the two locomotives were quite equal to the present amount of traffic.

The CHAIRMAN said the measure recently passed by the Chile Government granting a general amnesty would indirectly act very favourably towards their company, because no doubt the effect produced would be the return of large numbers of the labouring population, the absence of whom had caused the mineral resources of the district to be but imperfectly developed, and the general passenger traffic of the country diminished.

Mr. WHEELWRIGHT said the main traffic of the line was the transit of mineral. The had had considerable passenger traffic, but, unfortunately for them, the commerce of the country met a serious check by the crisis, through which alone their passenger traffic had fallen off, but there could be no doubt the effect of the enactment recently passed by the Government would be the gradual increase of their passenger traffic.

The CHAIRMAN said the advices received by every mail proved that the general affairs of Chile were steadily improving, and there was no doubt the general position of the affairs of the company must continue to improve in the same ratio as those of the country.

Mr. POTYDER enquired if the present rolling stock was nearly worked up to its fullest extent?—Mr. WOODS replied that all they required, and that only in case of accident, was a third locomotive, the present rolling stock being more than equal to the requirements of the traffic.

Mr. WHEELWRIGHT said their misfortune was that a few days after the said line was finished the revolution took place, which stripped the whole province of labourers. But the general amnesty would enable the miners, who had fled to the other side of the mountains, to come back and resume their avocations. In the meantime the traffic of the province was being developed—in fact, the whole of the railroads constructed in that neighbourhood had made their own traffic by offering facilities for the development of the resources of the districts intersected. The Castillo Mines were now producing 4000 quintals per month. In consequence of the late depressed price of ore those mines had not been vigorously prosecuted, but now that a more encouraging

stating that there was a large field for the profitable employment of capital for years to come in the development of the mineral resources of the country.

The report and accounts were then received and adopted, and a unanimous vote of thanks to the Chairman and directors terminated the proceedings.

AFRICAN STEAM SHIP COMPANY.

The ordinary half-yearly meeting of proprietors was held at the company's offices, Mining-lane, on Wednesday.—Mr. P. D. Hadow in the chair.

Mr. D. CAMPBELL (the secretary) having read the advertisement convening the meeting, submitted the report of the directors, which stated that in preparing the accounts they had made the usual reserve of 7½ per cent. per annum for depreciation; they had extinguished the loss on the sale of the *Gambia*, discharged the cost of the rest of the *Retriever*, augmented the boiler fund, and written off a portion of the loss sustained by the sale of the *Hope*. The amount brought down to the credit of revenue account was £7311. 16s. 9d., out of which they recommended the payment of the usual dividend of 7s. per share, free of income tax, for the half-year ending Oct. 31, 1861. This payment, which was at the rate of 7 per cent. per annum on the company's capital, would absorb £4816l. The directors have much pleasure in reporting that during the past six months the mail service had been performed in a most satisfactory manner, the ships had kept their contract time without a single exception, and they were all in a thorough state of repair and efficiency. The *Retriever* would be dispatched to the coast in a few weeks to resume the international service. The directors also had the pleasure to report that the *Macgregor Laird*, at present building in the Clyde, would be launched early in December. This vessel was being most carefully constructed under the inspection of one of the company's officers, and as all the modern improvements would be applied to her, the directors expected she would form a most valuable addition to the fleet.

The CHAIRMAN, in moving the adoption of the report and accounts, stated that although the report was not remarkable for prolixity, yet he thought it contained materials which would induce proprietors to give it a favourable reception. The period which had intervened since they last met had not been marked by any incident of importance; nevertheless, the result was more satisfactory than that of any previous half-year. The voyages of their ships had been performed with regularity, and free from any casualty, while the net receipts were greater than in any former corresponding period. The consequence was that after payment of dividend, and making provision for every liability, they were enabled to write off the loss arising upon ships previously sold a larger sum than heretofore; and it would be his duty to submit presently a special resolution authorising such an appropriation of a portion of the balance. Although they could not expect that every half-year would be so fortunate as the last as regarded freedom from those casualties to which every ocean navigation company was liable, he saw no reason to doubt that with the exercise of the same vigilant superintendence they would continue as prosperous as they had been during the past few years, previous to which they were in a much lower position, and paid only a very small dividend. When, however, they got the contract enlarged they enabled to perform the service with more efficiency, and with greater profit. The *Macgregor Laird*, alluded to in the report as building, was launched on Tuesday in the Clyde. From the improvements introduced in the machinery of that vessel it was expected that her consumption of coal would be 30 per cent. less than that of other ships of the same tonnage and power, which he need not say was a matter of great importance, considering that the item of coal on the African coast stood in their accounts at 3s. a ton (hear, hear). The *Macgregor Laird* would be ready for sea in about six weeks, and would probably take out the Jan. or Feb. mails.—Mr. DUKIN seconded the motion.

In reply to a question from Mr. DE SALIS.

The SECRETARY stated that the *Macgregor Laird* was of 200-horse power; her length was 240 ft.; her draught 15 to 16 ft.; her consumption of coals 13 to 15 tons a day; leaving 650 tons for cargo. And in reply to Mr. A. Beattie, he added that the object of keeping so large a quantity of coal in stock was to equalise the price. As against the ships the coal was charged equally at 3s. a ton.

The resolution being unanimously adopted, the usual dividend of 7s. per share, free of income tax, for the half-year ending Oct. 31, was declared.

The CHAIRMAN then proposed a special resolution that 2000l. towards the further liquidation of the loss arising on the sale of the *Hope*, be transferred from the revenue to the ships loss account.

A SHAREHOLDER doubted the expediency of reducing the balance by writing off the 2000l. referred to, and suggested the possibility of the present being a less prosperous half-year than the last, and of a difficulty in consequence of maintaining the same rate of dividend unless they had a balance to draw upon. Was it wise, with a war threatening, which must affect the interests of all shipping companies, to absorb so much of the balance, which at a future time they might want for the purpose of keeping up the dividend?

The CHAIRMAN admitted the possibility, but not the probability, of their not being in a position to pay a dividend in the current half-year, and observed that all they proposed to write was the 2000l. which they were better off this year than the last. They did not reduce the balance carried over beyond what it was at the commencement of the period, while on the other hand they wrote off 1000l. to the boiler account, and 1200l. towards the loss of the *Gambia*. If they should be pushed to make up the dividend on the next occasion it would only be necessary to abstain from writing off sums on these accounts, and there would be sufficient.

Another PROPRIETOR considered it advisable to write off these charges as soon as possible. The resolution was then put and carried unanimously, when the proceedings terminated with votes of thanks to the Chairman, directors, secretary, and the officers of the company.

TRUTH'S ECHOES; OR SAYINGS AND DOINGS IN MINING.

The Mining Share Market has been very active during the week, and the transactions have been both large and numerous. Although some shares have had more than ordinary attention, still there has been a more uniform enquiry than for some time past. The dividends declared from British mines during the month of November is given at 24,463l. 15s. Wales has contributed 6312l. 10s.; Cornwall and Devon Consols the remainder. The chief transactions have been in SETON, EAST CARBON BREA, EAST CARBON, WEST CARBON, and SOUTH CARBON, in most of which there have been several heavy transactions. WHEAL GYLLA, EDWARD, ARTHUR, TRELAWNY, LUDCOTT, MARY ANN, and other favourite shares have been done at an advance. Among the several shares of importance which this morning were noticed was that of WHEAL EDWARD, where, in driving the 60 cross-cut north, they have intersected a very flattering-looking lode, and have gone through it 5 feet, with no north wall.

MARKE VALLEY continues to look remarkably well, the several productive points returning the usual quantities of ore, with increasing reserves. The next sampling is computed at full 400 tons.

At WEST SHARP FOR the water is still in the bottom levels, which precludes the cutting through the lode in the 160 ft. level. At the meeting, held on Wednesday, a call of 3s. per share was made.

At EAST CARBON the counter lode continues without any change, the 50 east being worth 30l. per fm.; the 60 east, 40l.; and the rise about the same: the 60 east is not so far east by 35 fms. as the 50, consequently there is a fine course of ore to pass through. They have weighed off the parcel last sold, and from over-weight will increase that sale to upwards of 2220l. for the month. The next sampling is computed at 345 tons. Since writing the foregoing, letters have been received stating that the 50 east has improved, and is now worth above 100l. per fm., and the 60 east upwards of 50l. per fm. Fawcett's lode, in the 60 east, is worth 10l. per fm.

WHEAL ARTHUR continues to open out remarkably well. The middle lode is found highly productive at the 50, the western end yielding 3 tons, and the eastern 2½ tons per fathom; the backs are producing fair quantities of ore; and the old lode is equally productive. A few days more open the middle lode 13 fms. deeper; and as a good ore lode has gone down from the 50, course of ore is expected at that point.

KELLY BRAT is reported to be improving in the eastern ground. The lode in the 75 is worth upwards of 20l. per fathom, and is stated to be whole to the surface; from the trials made in the back, and found of the same value, there is every reason to believe that the lode will continue productive the greater portion of that distance.

SORTIDGE CONSOLS is stated to hold out much promise; and although no lode has been taken down for the past fortnight, there is no reason to anticipate any failure. They sampled last Friday 180 tons of copper ore, which is expected to refine, according to the present standard, full 1200l.

GREAT CRUIK shows good indications of improvement in several important places, where the lode is unusually large, especially in the 100 west, which is further proved by the winze in the same level in a very encouraging lode.

At WEST PAR an improvement is reported in the 65, where they are opening a long run of tin ground, fair stamps work.

ST. DAY UNITED is reported to have improved in the winze in the bottom of the 114, near Whel Unity. They sold on Saturday 40 tons of tin. At the meeting, held on Monday, the statement of accounts showed a credit balance of 476l. 17s. 5d.

At EAST CARBON BREA, the lode in the 26 is worth 20l. per fathom, and improving. Although the lode in the 40 cross-cut is poor at present, they still have an improvement, as the lode in the winze in the bottom of the 40 is 8 fms. deep, and worth 30l. per fathom, and will come down about 6 fms. from the cross-cut.

At GRAMBLER and ST. ARN they have intersected a new lode in the 40 cross-cut, which is looking well, and considered a valuable improvement.

At TRUMPT UNITED the lode in the 15 west continues productive for tin, and estimated worth 15l. per fm.

WHEAL DANIEL is stated to look very encouraging, as far as the operations have been carried in clearing. The new lode recently intersected is looking very much for an early improvement. There is a good lode of copper ore in the winze at bottom of the deep adit. FANT-Y-BEARNY very much improved; the lode in the 44 is worth upwards of 2½ tons of lead per fathom, and looking to further improve. The mine is likely to become one of the most important in the district.

JAMES LANE.

From Mr. EDWARD COOKE:—A slight check has been given to business by the pending American question, still a large amount of business has been transacted in several of our most prominent mines.—SOUTH CARBON, TINCROFT, DEVON GREAT CONSOLS, WEST CARBON, MARKE VALLEY, WHEAL GYLLA, and others. It will thus be seen that the Cornish district is well represented. It must be apparent to all who study the progress of our home mines that Liskeard is likely to become the seat of the most important mining district in England. Already it may be said to possess the richest mines in Cornwall, in East Caradon, South Caradon, Marke Valley, and Herodfoot, among copper mines; while it is fairly represented in that for lead by Herodfoot, WHEAL MARY ANN, LUDCOTT, and TRELAWNY. All these are mines that have already paid good dividends, and likely to continue them for many years to come. Other mines in the same locality will as certainly become equally rich when further developed.—GLASGOW CONSOLIDATED, CARBON CONSOLS, SOUTH HERODFOOT, NEW SOUTH CARBON, WHEAL NORTON, SOUTH CARBON WHEAL HOOPER, EAST WHEAL AGAR, &c. The whole of these mines are selling at such prices as cannot fail to well repay any amount of money expended in them. South and West Caradon become rich at a comparatively shallow depth; but owing to the geographical position of the adjoining mines, and the dip of the lodes, a greater depth will have to be attained in them before they can be expected to prove productive. A large amount of business has been done in WHEAL GYLLA; and notwithstanding the great advance that has recently taken place having induced the original holders to realize their profits, the price remains very firm and shares scarce. Upon a moderate calculation, 500l. per month as profits is expected to be realized, which would be equal to about 6l. per share per annum. At the present price, the estimate, the shares are very cheap. Another dividend of 5s. per share was declared on Thursday in TINCROFT. This has been anticipated in my former remarks; and I have every reason to believe that 25s. or 30s. per share will be paid on these shares in 1862. SETON shares have had the usual fluctuations, owing to the large speculative business that is generally done in them. EAST CARBON shares have advanced to 27½, buyers, the shares are likely to advance. The cutting of the south lode at WHEAL DOUBT is an important feature to the shareholders, as there will now be two lodes to work on. I am informed that the year 1862 will be commenced with a monthly profit of 4000l. to 5000l. It must be borne in mind that the most interesting point in the mine—the junction of the lodes in the 30 ft. level—has not yet been reached, still the mine is now making a good profit, and the question of any further calls appears to me to be improbable. Hav-

ing identified myself with this concern from its commencement by the present company, it affords me very great pleasure to witness its steady progress towards a profitable future. In the same locality, and adjoining the Great Consolidated Mines, is EAST WHEAL DANIEL, from which great things are expected. One of the Consols lodes is daily expected to be met with, and there is every probability of its being found rich. Should this prove to be the case, the shares, from being at a comparatively low figure now, will attain a high price. A map showing the mine, with its relative position to the rich mines of the district, has just been made by a talented correspondent to the Journal, by an actual survey both underground and at surface, which may be had gratis at my office. At NORTH MINERA the frost has impeded the dressing operations, but the mine is progressing well. NORTH DOWNS is reported to be looking well. A dividend of 5s. will be declared this month, and a considerable sum added to the balance, and the shares are standing at 5¼ to 5½. They are cheap as an investment.

PRESENT STATE OF THE MANUFACTURE OF RAILS.

RECENT IMPROVEMENTS ON FOREIGN RAILWAYS.

Being in the neighbourhood of the Phoenix Works, I determined to visit them, to obtain, if possible, some information respecting their methods of manufacture. It was truly a painful sight to see these fine works lying comparatively idle, only six or seven out of 78 puddling and reheating furnaces being in blast, though I was informed that it was proposed shortly to blow in 14 additional ones, probably on account of a large order I understood they were filling for the Lombard-Venetian line. Of the four blast-furnaces, only one was working. They were all built in the same manner, the masonry being very light, with a considerable taper from the bottom to the top, and entirely cased in sheet-iron, strengthened with ribs of the same material. The blast appeared to me to be but little compressed. The iron produced was principally grey, and run in metallic shells, which gives the pig, at the break, the appearance of being coated with white iron. The ore used was principally what is called *minerais de prairies*, a variety of the limonite or hydrated sesquioxide of iron containing considerable phosphorus. With this ore they use a large proportion of limestone, which materially improves the quality of the iron, making it harder and purer. The proportions of the charges are, eight of coke, four of mixed ore, and two of limestone, the ore and limestone being mixed together. These materials are raised to the furnace mouth by means of an endless chain with buckets, and also a water balance. They get up most of their steam from off the top of the coke ovens, these being heated by the gases which, given off by the coal itself in distilling, are led around the oven in flues. I noticed that they had a contrivance for shoving the entire load out at once, and water-pipes were brought over each oven door, for the purpose of drowning the load as it comes out. But my chief object, of course, was to investigate the subject of rails. I will take this opportunity to observe that those who know how difficult it is to obtain reliable information in an iron-works will need no apology for the comparative incompleteness of the following remarks. The packets for chair rails are formed as follows:—A single plate, 1½ in. thick, and the entire width of the packet (8 inches), is first laid down. This plate is made from a separate packet, composed of granulated iron, produced from the *minerais de prairies*, which packet is heated, hammered, and rolled. Then come two layers of granulated puddle iron, each layer composed of one broad and one narrow plate, the two laid so as to form a breaking joint. Next comes a plate of puddle-iron. Then a plate about 5 in. wide, composed of cut-off rail ends, rolled while still hot. (This operation I will speak of further on). Along side of this plate, on the same layer, and in order to complete the width of the packet, is placed another plate, 3 in. wide, made from a separate packet, formed of old material, rail butts, &c., which packet is rolled into shape without previous hammering. The succeeding layers (there are 10 in all) are of fibrous puddle-iron, except the top one, which is composed of two plates, 4 inches wide, and seven-tenths of an inch thick each, formed from a packet of old rail butts, &c., as just described. At the corners there are also placed, on their edges, two plates, 2 inches wide each, made in the same manner, their upper edges resting under the top plates. The entire rail packet thus formed is heated, very heavily hammered, reheated, and rolled. The rails made are not calculated for turning or reversing, as the lower head is much smaller than the upper—only large enough to be held well in the chair. They have two rail trains, one for chair and one for flange rails, each train consisting of three cages, one for roughing, one for finishing, and for rolling out the rail ends as they are sawn off, while still hot, into plates for the packets. To accomplish this, they pass them through six grooves. Each train is driven by a powerful horizontal cylinder engine, the crank being placed directly on the trunnion of the fly-wheel, without the intervention of spur gear. They state that they find much benefit from the preliminary hammering, in proof of which I was shown a pile of worn-out rails, made from unhammered packets, and certainly these gave evidence of very imperfect welding, the upper part of the head being in some instances entirely split off. Whether this proceeded from the want of hammering alone I am, however, unable to say. I was informed that a great economy had been brought about in this department within a few years, rails now costing them to make 10 shillings, or about 30s. less per 1000 lbs. (Prussian) than they did three years ago. The quality of the rails is unimpeachable. They made some time ago a series of experiments on the heads of their rails, to see how they compared with cast-steel. These experiments were made with an exceedingly beautiful and perfect drilling machine, 200 turns being given, first on the rail-head, and then on a bar of cast-steel. The results gave an average of 70 per cent. for the rails as compared to cast-steel, but it is evident that this was too low, for, always commencing on the rail, the drilling-bit, which was not re-sharpened, became dull before being applied to the steel. The fair average would probably be 70 to 80 per cent. Some rails, I was informed, went as high as 90 per cent. They were making for their rails a new description of fish plate, which forms at the same time a species of chair, which must greatly add to the solidity of the join, but which is exceedingly difficult to roll.

I also visited the fine establishment of Messrs. Jacobi, Hannell, Hayssen, and Co., at Oberhausen. There are here four furnaces in blast, of which three were running white and one grey iron. There is a fifth furnace in construction, nearly completed. The masonry of these furnaces is exceedingly massive, they being 44 feet wide at the base and 38 feet at the top, total height 55 feet. The interior form is square. Each furnace is blow with two tuyere pipes, with ¾ to 4 in. nozzles, and a pressure of ¾ in. of mercury. The blast is heated to 100 centigrade degrees, but it is intended to heat that of the new one up to 250° centigrade. The furnaces are loaded with a mixture containing many different kinds of ore—blackband, clay-band, Nassau ore (a red ore, very siliceous), &c. At the end of about every three years, I was informed, they have to blow out and renew or repair the interior masonry. This rapid degradation is owing to the corrosive nature of some of the ores used, particularly that of Nassau, owing to its silica; and the high temperature required to fuse it, from its hard, compact character. The combustible used is coke, and the blowing-engine boilers are heated by the gas which, generated in the coke ovens, is led underground to them. The boilers are constructed very similarly to those used with ordinary fuel. They run three times a day, each running producing from 13,000 to 14,000 Prussian lbs. of iron. The white iron is run into cast-iron shells, but the grey pigs are formed in the sand. The cinder as it flows out is received into cast-iron moulds, placed on small wagons; these moulds are raised off by means of a small crane, leaving the block of cinder on the wagon, in the shape of a truncated pyramid of four lateral faces. This shape seems to be given it merely to facilitate its transport off the premises, for the cinder is not utilised in any manner. Hydraulic balances are used to raise charges, &c. The information I collected here relative to rails is exceedingly meagre. The packets were about 10 in. high by 9 in. wide for flange rails (5 in high, with a 4-in. flange), a single plate of apparently once reheated iron, and two upright corner-pieces, forming the flange, and four corner-pieces on the top of the packet; all the rest seemed to be puddle iron. The packet, when withdrawn from the welding-furnace, is conveyed on a small truck to the steam-hammer, and thoroughly beaten, first flatwise, then on the edges, and so on alternately, finishing on the flat. It is then taken in the same way to the reheating furnace, whence it is conveyed to the rolls, going six times through the roughers, and five times through the finishers, first with flange up, then with the flange turned sideways alternately to the right and left. Both ends are sawn hot. They formerly rolled the packets immediately without previous hammering, but found that they produced a better, stronger, and handsomer rail by treating them in the manner just described. The test rails must stand it, to be placed on two supports a yard apart, and undergo an hydraulic pressure that bends them 1½ in. without showing any crack or split when they come up. I was informed that they would easily stand a much greater pressure.

The following are some details relative to the rails used on some of the German lines:—

CORLENDEN LINE.—Rails must be 18 Rhenish feet long. Test: Resting freely in its natural position on supports 3 feet apart, must bend 3 in. without any sort of rupture; and must, also, under similar circum-

stances, support 300 zoll centners* placed in the middle for several hours without permanent bend. The packets from which these rails are formed must be composed of iron, entirely free from cinder; they must be brought to a welding heat, and passed under a 60 zoll centner hammer till reduced to the dimensions of 8 × 12 zoll, thence taken to the reheating furnace, brought again to the welding heat, and rolled.

It is admitted that flange rails should have hard heads, but that for chair rails the first condition is homogeneity. On the Rhenish road they experienced a difficulty from the imperfect welding of the different natures of iron employed. This defect did not manifest itself the first year, but the third or fourth; the corners broke off vertically, or else the whole head split off for a considerable length.

WESTPHALIAN LINE.—A separate packet is destined to form the top piece of the entire rail packet. It is composed of eight layers, each layer being ¾ zoll thick. The top and bottom of this packet are formed of single plates, the entire width of the packet, composed of once-reheated iron; the interior layers are of two plates, each of puddle-iron; all the iron in this packet is granulated. It is rolled flatwise, without previous hammering, down to the thickness of two zoll. The bottom plate is entirely of fibrous iron, the outside plates being rolled from fibrous rail ends; it is rolled edgewise down to a thickness of 1 zoll. The rail packet is then formed, only the corner pieces are omitted. This packet is heated and hammered down to 7 zoll square, then re-heated and rolled into rails 5 zoll high. It is impossible to tell how these rails will stand, as they have been made in this manner since 1858 only. All choice of materials and method was left to the discretion of the manufacturer, with the stipulations only that the packet should be hammered before rolling, and a three years' guarantee given.

I will conclude these observations by the following memoranda, taken by me at the Société Anonyme de Castelnau, near Charleroi, Belgium. I estimated the dimensions of the packets to be 48" × 8" × 6", and I was informed that they would weigh 300 kilos. If this be true, my estimate is probably a little under the mark, for the dimensions I have stated would scarcely give a weight of 660 lbs. The rails they were rolling from these packets were, when finished, 6-16 metres and 6-20 metres long (20 ft. 2½ in. nearly, and 20 ft. 4 in.), and weigh, the 6-20 metre ones, 230 kilos, or 506 lbs. They (the packets) are composed entirely of puddle iron, granulated for the head, and hard for the rib, with the exception of a single plate the entire width of the packet of once-reheated iron, for the flange. The packet is heated a good hour, then rolled, without previous hammering, six times in the roughing and six times in the finishing rolls. In the roughing rolls the packet goes through the first groove on the flat, then edgewise in the two succeeding ones, receiving in the latter of these two the commencement of the rail form; then flatwise; then, lastly, on the edge. The first groove of the finishers takes the rail in an upright position; all the rest are on the side. The test to which the rails are subjected is, that resting on supports 1 metre apart, they shall bear the shock of a 300 kilogrammes weight, falling through 250 metres. These rails, I believe, were being made for Spain.

* The zoll centner is a weight of 100 zoll pfund, and the zoll pfund being equal to exactly 500 grammes, French measure, the zoll centner equals 50 kilos, or 110 English pounds and a fraction. The zoll or inch, which will shortly be mentioned, is from the source whence I draw my information, an engineering journal published in Berlin, probably the Rhenish inch, of which 12 make the Rhenish foot. The Rhenish foot equals 313 millimetres and a fraction; the zoll is 26 millimetres, or 1-1 in. English.—E. S. G.

TARANAKI STEEL AND IRON COMPANY.—A petition for an order was made before Mr. Commissioner Holroyd, on Saturday, for winding-up. The petitioners were—Augustus Van Gheulwe, T. Catherine-court, Tower Hill, merchant; F. Holdway, 1, Brunswick-place, Shepherd's Bush, coachmaker; B. Stader, 9, Bruton-street, Berkeley-square, merchant. The petition alleged that the company was formed in March, 1860, for the purpose of carrying into effect an agreement to dig for iron-sand, &c., in New Zealand, and to convert the same into marketable iron or steel for exportation, or to export for sale the said iron-sand, &c., in its natural state. The petitioner Gheulwe held 1000 shares, Holdway held a similar, and Stader held 100 shares. The petitioners further alleged that three-fourths of the capital had been lost. Mr. Bagley appeared in support of the petition. Mr. Roxburgh opposed it. It appeared that the position of the company in reference to the alleged loss of capital had not been clearly ascertained. A call had been made by the company, but it turned out to be invalid, and the directors were now desirous of again addressing the shareholders. An adjournment was ordered.

TURN-OUT OF COLLIERIES AT ASHTON.—In consequence of the expiration of a notice to reduce collieries taken in Ashton and other places adjacent 2d. In the shilling, a general turn-out has taken place in Ashton and Bredbury, and at several pits in Denton. A turn-out has also been contemplated at Astley's Deep Pit, Dukinfield, and several men up to Tuesday had left work. In consequence of information that many colliers were about to visit Astley's Deep Pit on Tuesday morning, when the men working there were going to their work, the precaution was taken to have a number of police in readiness, to prevent intimidation or a breach of the peace. About 100 men came from Ashton and other places, and endeavoured to prevail on the men not to go to work, and they succeeded with several. No violence or intimidation was used.—*Manchester Guardian*.

MARVELLOUS DESCENT DOWN A COAL SHAFT.—The other day a lad named Hazard, whilst emptying a barrel of water at the Eckett Iron Ore Company's pit, at Frizlington, slipped, fell 170 feet down the shaft, head foremost, but, strange to say, alighted without sustaining any injury. He owed his escape to the fact that there was a depth of 10 ft. of water at the bottom of the pit. His head was jammed in the mud at the bottom of the pit, but he had presence of mind enough to press himself free; he then floated on the water, and was happily recovered, not much worse for his perilous descent.

ACCIDENTS IN BLASTING.—At Stray Park Mine, John Carlean and John Champion were injured, the former it is feared mortally, by the explosion of a hole while tamping.—At South Caradon, Isaac Walters and his comrade were injured through the explosion of a charge whilst picking out a hole that had missed fire.

From British Columbia, the late advices regarding the yield of gold are extremely favourable. New discoveries of great richness had been made, and in some localities the miners were realising larger sums than have ever been obtained by individuals in California or Australia. The instances of persons gaining steadily from 10l. to 30l. a day were numerous. Two labouring men had just arrived at Victoria, Vancouver's Island, with 1400l. the produce of only a few weeks. Success was so general, that it is said "we hear of no dissatisfied miners." A large immigration was consequently expected, but the great drawback consisted in the absence of steam communication between San Francisco and Victoria.

THE ST. JUST TIN MINES.—We are much pleased to learn that the applications for shares in this company are numerous, more especially from the mining counties. Great efforts have been made for some years past to obtain a grant of this sett, and we are very glad success has attended those efforts. It is an old mine that most of the leading miners in the county entertain a high opinion of.

TREGULLON-CONSOLS MINE, the sale of which is advertised in another column, is worthy the notice of mining and other gentlemen, being situated in the best mining district of Cornwall.

LEEDS, DEC. 5.—In Mining Shares rather more animation has been manifested, and a few shares have changed hands at low prices; though this, with every other description of stock, partakes to some extent of the depression which now prevails.—Craven Moor, 2s. 6d. to 3s. 6d.; Cornubia, 1s. to 20s.; Hebdon Moor, 20s. to 25s.; Merryfield, 5s. to 6s. 6d.; North Hallenbeagle, 12s. to 13s.; ditto, fully paid, to 15s.; 20s.; Nidderdale, par to prem.; North Jane, 30s. to 40s.; Wensleydale, 7s. 6d. to 8s. 6d.; West Barton, 100l. to 110l.; York, 10s. to 110s.; Yorkshire, 10s. to 100s.

CONTRIBUTORS TO THE MINING JOURNAL.—The prospects and produce of this mine continue to improve; they are now raising considerable quantities of lead ore, and have already obtained what will produce upwards of 30 tons of pig-lead, and it is expected it will be increased to 50 tons by the end of the year. The lead is got from a rise in the level, which is driven from the bottom of the 45 ft. shaft, the ore in which is from 8 to 18 inches wide, nearly solid.

MERRYFIELD MINING COMPANY.—An improvement has taken place in this mine, and an increased quantity of ore is being raised, with a prospect of its continuing; an additional number of miners have lately been set to work at metal pitches, and it is contemplated to increase the number.—JOHN GEDDILL and Co.

RAILWAY CALLS.—The amount falling due in Dec. (all for England) is 625,361l.—making the total called during the present year 13,545,154l.

WEEKLY LIST OF NEW PATENTS.

APPLICATIONS FOR LETTERS PATENT.—T. ELLIS, Swindon: Rails for permanent ways.—S. TONKS, West Bromwich, Stafford, and J. BROOKS, West Bromwich: Steam-boiler furnaces.—R. D. CHATTERTON, Cobourg, Canada: Safety-buffer or apparatus to be used in railway trucks to prevent accidents from collisions.—G. RALESTON, Tottenham-yard, London: Preparing and applying a certain material on the hulls of iron or wooden ships, or on the surfaces of materials for building the same, also for preventing oxidation and tubercles in iron water-pipes.—JAMES BROWN, Stratford: Fire bars and furnace.—FIRTH and RIDLEY, Leeds: Apparatus and machinery for working coal and other mines.—DOMSTORPE, FIRTH, and RIDLEY, Leeds: An invention for the same purpose.—JOHN STANDFIELD, Stratford: Regulating and indicating the speed of steam-engines.—T. DUMARCHET, Strasbourg: Ore crushing machinery.—GEORGE KYDILL, Dewsbury: Smoke consumers and ventilators.—WHEATLEY and LUMLEY, Old Brompton: Ventilators.—J. BONNE, Paris: Furnaces for working iron ore.—P. SPENCE, Newton Heath, Manchester: Treatment of ores for sulphuric acid, and treating ores for separating metals therefrom.

THE IRON AGE.—At the Polytechnic Institution, on Monday, Professor J. H. PEPPEY, F.R.S., commenced two new lectures—"The Iron Age" and "The Science of the Armstrong, Whitworth, and other Rifled Guns." The lectures, being particularly appropriate to the present state of political affairs, were very well received by a large audience.

MINING AND SMELTING GLOSSARY.—Now ready, price 2s., a NEW EDITION, enlarged, of THE ENGLISH AND FOREIGN MINING GLOSSARY; to which is added the SMELTING TERMS used in France, Spain, and Germany. Published at the Mining Journal office, 26, Fleet-street, and may be obtained through all booksellers and newsmen.

THE LLANMORLAIS COLLIERY COMPANY (LIMITED).

Capital £20,000, in 10,000 shares of £2 each.
10s. per share to be paid on application, and 10s. on allotment.
The remainder of the capital not to be called up without the consent of a general meeting of shareholders, and then only by instalments of 5s. per share, and at intervals of three months.

DIRECTORS.
A. C. HOWDEN, Esq., Boundary-road, St. John's-wood.
Col. R. Y. BUSH, Esq., York-terrace, Regent's-park, N.W.
Capt. J. D. MACQUEEN, Whitehall-yard, S.W.
THOS. F. AUSTIN, Esq., 35, Mark-lane, E.C.
S. W. HOOPER, Esq., Fleet-street, E.C.
W. C. KIRKHAM, Esq., 15, St. Anne's-square, Manchester.
(With power to add to their number.)

BANKERS—The City Bank, Threadneedle-street, London.

SOLICITORS—Messrs. Hancock, Sharp, and Hales, Tokenhouse-yard.

BROKER—F. Everett, Esq., 17, Royal Exchange.

OFFICIAL AUDITOR—F. Maynard, Esq., Accountant, 19, Broad-street, Chancery.

(Another to be chosen by the shareholders.)

SECRETARY—Mr. Charles Warwick.

OFFICES—25, BUCKLESBURY, LONDON, E.C.

The Llanmorlais Colliery is situated in the parish of Llanidloes, in the Gower district, in the county of Glamorgan, about half a mile from the Burry River, and nearly opposite Llanelli, South Wales.

The mineral rights are about 300 acres in extent, and contain ten workable seams, of the aggregate thickness of 42 ft. 11 in., varying from 4 to 7 ft. each, of highly bituminous coal, and are held on various grants for long periods, subject to an average royalty of 9d. per ton on the coal raised.

The coal of this district is admitted to be of the very best quality for house, gas, smiths, engine, and manufacturing purposes.

A shaft has already been sunk by the present proprietors to the depth of about 200 ft., intersecting two of the seams of coal, one of 6 ft. and the other 4 ft. 9 in. in thickness, the latter having been won since Mr. Rosser made his inspection; these extend about three-quarters of a mile in width, all underlying north in a slanting direction, and are workable to the depth of 700 fms. The present pit is of sufficient size for an outlet of the workings for all the seams, and by making a drift south from the bottom of the shaft for about 300 fms. it would intersect the whole, and lay open workable coal to the extent of 300 to 400 tons per day; every one of the ten seams has been opened from the crop on the surface to a depth of about 20 to 30 yards of old workings, proving beyond a doubt their existence within the before-mentioned limits.

From the two seams now laid open 60 to 70 tons of coal per day can be easily raised, and as soon as the necessary plant and road are completed, which will not occupy more than two to three months, shipments to that extent can be made. Orders have already been received by the present proprietors from France and Ireland for large quantities; and it is well known that the demand for this description of coal far exceeds the present supply.

The total cost of the coal placed on board the vessels will not exceed 4s. 6d. to 5s. per ton, which is confirmed by the report of Mr. Rosser, the well-known mineral surveyor of Llanelli; the selling price of the same being on an average 7s. 6d., a clear profit of 2s. 6d. per ton remains, which upon a working of only 60 tons a day will yield a profit of 17½ per cent. on the capital now proposed to be paid up; but as the workings will daily increase, 100 tons a day may be shortly relied upon, and the profits increased accordingly.

During the last Session of Parliament an Act was passed for making a railway, connecting this and other important collieries with the new floating docks at Swansea; this line is expected to be completed in less than two years, which must add immense value to the Llanmorlais property; and as it is only intended to call up £1 per share for the present, ample provision is made by the reserved capital to enable this company to construct a branch in connection with the intended line, and then to increase their workings in proportion.

The colliery has been purchased of the present proprietors, who have extended a large sum of money in making the necessary discoveries, for the sum of £8500, of which £2500 only are to be paid in cash, and the remainder in paid-up shares of the company.

The directors have made arrangements that, until the shareholders shall have received a dividend of 7½ per cent. on the paid-up capital, the expenses of the London offices, including rent and remuneration to the secretary, shall be £100 per annum.

The plans and sections can be seen, and all further information be obtained by application to Mr. Warwick, at the offices of the company, 25, Bucklebury, London, E.C.

Application for prospectuses and shares to be made to the bankers or brokers, or at the offices of the company, as above.

EAST ABRAHAM MINING COMPANY, CORNWALL.

Capital £6000, in 600 shares of £10 each.

This important mining property is situated in the richest copper mining district of Cornwall, distinguished by the immense riches returned from the same lodes in the adjoining mines, exceeding the amount of £2,500,000 sterling. The lode near the boundary of Wheal Abraham, dipping into and extending through the entire length of East Abraham Mine, was worth from £100 to £150 per fathom. In the deeper working it increased in value to £200 and upwards.

East Abraham Mine is divided into 600 shares of £10. There has been £4500 expended on the well-known mining operations, coupled with that of Capt. Luke, the local agent, from whose reports the directors felt fully justified in prosecuting the undertaking.

Operations were accordingly commenced on the 10th, and a course of lead opened up, which, when assayed, yielded 80 per cent. of lead, and 15 ozs. of silver to the ton of ore. About 30 tons of lead ore have been already brought to grass by tributaries, at 10s. in £1 sterling, and the men thus employed are making excellent wages; and from the appearance of the ground by sinking 10 fms. deeper, which is now being done, the ore can be stopped away in large quantities, while the company are deriving great advantages at no outlay to themselves. It is, however, proposed to extend the operations in this portion of the mine, and from comparative small outlay the company will be able to realise very considerable and immediate profits.

It was further determined to ascertain the position of the copper lodes which were known to run through the set, and they requested the superintending captain of the Collicombe Mine, Capt. J. A. Richards, of the Devon Great Consols, and Capt. Mitchell, the local manager of Collicombe, to give their opinion as to the prospects of discovering copper. Those gentlemen accordingly having ascertained the dip of the lodes running from the Collicombe through Wheal Concord, and making their calculations as to distances, gave it as their decided opinion that by driving the 38 fm. level 30 fms. from the engine-shaft they could not fail of cutting the main Collicombe copper lode; and as this lode dips towards the shaft, by sinking deeper the same lode could be reached by a short cross-cut; it was accordingly determined to follow the advice thus given, and on examining the 38 it was found that it had been already driven 15 fms. The remaining 5 fms. have now been nearly completed, and from the mineralised state of the ground, together with its character being precisely similar to that of Collicombe, there is little doubt but that copper ore is close at hand, and when cut will form a valuable addition to the profits to be derived from working this set.

From the work already done, it is calculated in order to complete the machinery and efficiently develop the property that £3000 will now be ample for such a purpose, and that the advantages to be derived cannot fail to be very considerable. A 40-in. cylinder engine will be erected, so that when the surface water falls the workings shall continue, at a moderate cost, by the use of steam.

From the statement of facts now made, the directors have great pleasure in congratulating the shareholders on the success already attained, and they have every reason to believe that, as the mine is already well opened, this undertaking will shortly prove a first-class dividend mine.

Every information can be obtained by application at the offices of the company.

By order, W. S. TROTTER, Sec.

WHEAL CONCORD SILVER-LEAD AND COPPER MINING COMPANY (LIMITED).

OFFICES.—No. 1, GREAT WINCHESTER STREET, LONDON, E.C.

At a meeting of the directors of this company, held at the offices, on Monday the 25th of November, 1861, it was resolved to issue the following statement to the shareholders:—

The set acquired by this company adjoins the well-known Collicombe Mine, the lodes of which run through the company's property. Its extent is upwards of 350 fms. east and west on the run of the lodes, and 520 fms. north and south, embracing seven known promising lodes.

The shaft has already been sunk to a depth of 550 fms., numerous levels have been driven, and since the present company commenced its operations they have erected a water-wheel, work the pumps with which the mine has been drained. During the summer months, while the surface water failed, they have employed a portable engine, but during the winter season there is ample water-power for all the purposes of the mine.

The shafts and levels having been completely drained a thorough examination of the ground was made by well-known mining captains, coupled with that of Capt. Luke, the local agent, from whose reports the directors felt fully justified in prosecuting the undertaking.

Operations were accordingly commenced on the 10th, and a course of lead opened up, which, when assayed, yielded 80 per cent. of lead, and 15 ozs. of silver to the ton of ore. About 30 tons of lead ore have been already brought to grass by tributaries, at 10s. in £1 sterling, and the men thus employed are making excellent wages; and from the appearance of the ground by sinking 10 fms. deeper, which is now being done, the ore can be stopped away in large quantities, while the company are deriving great advantages at no outlay to themselves. It is, however, proposed to extend the operations in this portion of the mine, and from comparative small outlay the company will be able to realise very considerable and immediate profits.

It was further determined to ascertain the position of the copper lodes which were known to run through the set, and they requested the superintending captain of the Collicombe Mine, Capt. J. A. Richards, of the Devon Great Consols, and Capt. Mitchell, the local manager of Collicombe, to give their opinion as to the prospects of discovering copper. Those gentlemen accordingly having ascertained the dip of the lodes running from the Collicombe through Wheal Concord, and making their calculations as to distances, gave it as their decided opinion that by driving the 38 fm. level 30 fms. from the engine-shaft they could not fail of cutting the main Collicombe copper lode; and as this lode dips towards the shaft, by sinking deeper the same lode could be reached by a short cross-cut; it was accordingly determined to follow the advice thus given, and on examining the 38 it was found that it had been already driven 15 fms. The remaining 5 fms. have now been nearly completed, and from the mineralised state of the ground, together with its character being precisely similar to that of Collicombe, there is little doubt but that copper ore is close at hand, and when cut will form a valuable addition to the profits to be derived from working this set.

From the work already done, it is calculated in order to complete the machinery and efficiently develop the property that £3000 will now be ample for such a purpose, and that the advantages to be derived cannot fail to be very considerable. A 40-in. cylinder engine will be erected, so that when the surface water falls the workings shall continue, at a moderate cost, by the use of steam.

From the statement of facts now made, the directors have great pleasure in congratulating the shareholders on the success already attained, and they have every reason to believe that, as the mine is already well opened, this undertaking will shortly prove a first-class dividend mine.

Every information can be obtained by application at the offices of the company.

By order, W. S. TROTTER, Sec.

RAILWAYS AND MINES.

AND MESSRS. R. TREDNICK AND CO.'S TRADE CIRCULAR.

STOCK AND SHAREBROKERS AND DEALERS IN BRITISH MINING SHARES, 78, LOMBARD STREET, E.C.

Capitalists who seek safe and profitable investments, free from risk, should act only upon the soundest information. The market prices for the day are for the most part governed by the immediate supply and demand, and the operations of speculators, without reference to the bona fide merits of the property. Railways depend upon the traffic, expenditure, and capital accounts, the probabilities of alliance or competition with neighbouring companies, the creation of new shares, the state of the money market as affecting the renewal of debentures, and other considerations founded on data to which those only can have access who give special attention to the subject. Mines afford a wider range for profit than any other public securities. The best are free from debt, have large reserves, and pay dividends bi-monthly varying from £15 to £25 per cent. per annum. Instances frequently occur of young mines rising in value 400 or 500 per cent. But this class of security, more than any other, should be purchased only upon the most reliable information. The undersigned devote special attention to railways and mines, afford every information to capitalists, and effect purchases and sales upon the best possible terms. Thirty years' experience in mining pursuits justifies us in offering our advice to the uninitiated in selecting mines for investment; we will, therefore, forward, upon receipt of Post-office order for 5s., the names of six dividend and six progressive companies that will, in our opinion, well repay capitalists for money employed.

Messrs. TREDNICK AND CO., 78, LOMBARD STREET, LONDON, E.C.

INVENTORS' ALMANAC FOR 1862. Fourth annual issue.

Copyright. Coloured sheet. Contains Classification of British Patents for 1860, according to locality of applicant, and Analysis according to subject, prepared expressly for this almanac. Also, Chronological Table of important Inventions, Patent Offices and Statistics, Birthdays of Inventors, &c.

Compiled by Mr. HENRY, Mem. Soc. Arts, Patent Registration and Copyright Agent, Patent Office, 84, Fleet-street, London. Sold by Watson and Son, 3, St. Ann's-lane, General Post Office, E.C.

Price 6d. mounted.

GOVERNMENT INSPECTION OF COAL MINES

TO WHICH IS APPENDED THE ACT FOR THE REGULATION AND INSPECTION OF MINES,

which came into operation on January 1, 1861.

London: Mining Journal office, 26, Fleet-street, London, E.C.; and of all booksellers and newsmen.

CALEDONIAN RAILWAY COMPANY.—At an

EXTRAORDINARY GENERAL MEETING of the shareholders of the Caledonian Railway Company, held at Glasgow, 24 December, 1861.

Lieut.-Col. SALKELD in the chair.
The Secretary having read the advertisement calling the meeting, it was resolved unanimously:—

1.—That the sum of £25,000 be raised under the powers of the "Carlisle Citadel Station Act, 1861," that the sum of £50,000 be raised under the powers of "The Caledonian Railway (Stonehouse Branch) Act, 1861," that the sum of £100,000 be raised under the powers of "The Caledonian Railway (Cleland Extension and Branches) Act, 1861," that the sum of £180,000 be raised under the powers of "The Caledonian Railway (Rutherglen and Coatbridge) Act, 1861," and that the sum of £39,550 be raised under the powers of "The Caledonian and Symington, Biggar, and Broughton Railways Amalgamation Act, 1861," and that these several sums, amounting together to £484,550, be raised by the creation of 19,352 half shares, of £25 each, to be called "Caledonian Railway Four and a Half per Cent. Preference Half Shares," bearing a dividend at the rate of Four and a Half per cent. per annum in perpetuity, preferable out of the profits of each year, commencing on the first day of February, in priority to the Ordinary Shares of the company.

2.—That the first instalment shall be £2 10s. per share upon the said Preference Half Shares, and the same shall be payable on the 27th day of December next, and the remaining instalments shall be payable at such periods as may be fixed by the directors, under the provisions of the Caledonian Railway Act, 1845.

3.—That the directors be, and they are hereby, empowered to allocate the said shares to those holders of stock and shares who may apply for the same, and agree to pay the first and remaining instalments as the same respectively fall due—whom falling, to such other parties as may make application and come under a like obligation.

4.—That so soon as the said several sums of £25,000, £50,000, £100,000, and £180,000 shall have been subscribed for, and one-half thereof shall have been paid up, the directors be, and they are hereby, authorised in addition to the amount which they are or may be authorised to borrow by any other Act of Parliament, from time to time to borrow on mortgage; and if paid off, again to borrow any sum or sums of money not exceeding in the whole the following, namely:—In terms of the "Carlisle Citadel Station Act, 1861," £25,000; in terms of "The Caledonian Railway (Stonehouse Branch) Act, 1861," £26,000; in terms of "The Caledonian Railway (Cleland Extension and Branches) Act, 1861," £25,300; and in terms of "The Caledonian Railway (Rutherglen and Coatbridge Branches) Act, 1861," £20,000.

5.—That when and so often as the sum of £12,000, borrowed by the Symington Company, or any part of such sum, shall be paid off, the directors be, and they are hereby, authorised to re-borrow, upon mortgage, on the security of the company's undertaking, any sum or sums of money not exceeding the amount so paid off, in terms of "The Caledonian and Symington, Biggar, and Broughton Railways Amalgamation Act, 1861."

6.—That as soon as the said sum of £39,550, authorised by "The Caledonian and Symington, Biggar, and Broughton Railways Amalgamation Act, 1861," and the sum of £48,000, authorised by "The Symington, Biggar, and Broughton Railway (Extension) Act, 1860," shall have been subscribed for, and one-half thereof shall have been paid up, the directors be, and they are hereby, authorised from time to time to borrow on mortgage, on the security of the company's undertaking, and, if paid off, again to borrow any sum or sums of money, not exceeding in the whole £24,500, in addition to the said sum of £12,000, and to the amount which they are or may be authorised to borrow by any other Act of Parliament.

THOS. SALKELD, Chairman.

ARCH GIBSON, Secretary.

TO MINERS.—WANTED, to go out to the south of St. Paul of

Loanda, the residence of the British Commissioner and of the British Consul General, who have been there many years, in the Portuguese provinces of Angola, south of the line, and the nearest place on the west coast of Africa, about 30 days passage from Europe, and having monthly steam communication with same.

ONE FIRST-CLASS INTELLIGENT MINE CAPTAIN, to direct one or more copper or other mines, and take charge of same in the occasional absence of the general superintendent, a scientific English gentleman.

ONE CAPTAIN DRESSER, competent and capable of taking charge of the dressing and washing of copper ores.

ONE MINE SMITH, knowing something of the management of circular saws, steam-engines, &c., a good practical man, capable of setting up any mining machinery.

ONE VERY GOOD MINE CARPENTER, knowing all about timber sawing by circular saw.

ALL GOOD MINERS, all well used to blasting.

All applications, with first-class testimonials or references as to character, qualifications, intelligence, steadiness, and sobriety, to be addressed to Mr. L. A. MONTEIRO, 51, Manchester-street, Manchester-square, W., who is fully authorised to treat.

WANTED, ONE OR TWO NEW OR SECOND-HAND

CONTRACTORS' LOCOMOTIVE ENGINES, with wheels, 4 ft. 6 in. diameter, and not less than 14 in. cylinder.—Apply, with full particulars and price, to CHARLES CLARKE, Smithwick, near Birmingham.

WANTED, A SECOND-HAND HORIZONTAL HIGH

PRESSURE STEAM ENGINE, complete, from 18 to 25 horse power. Price lowest price, and where delivered.—Apply to J. SYKES, Leek.

WANTED, A QUANTITY OF BRIDGE OR LIGHT

CONTRACTORS' WROUGHT IRON RAILS, from 22 to 28 lbs. per yard, for colliery purposes.—Apply, stating price, &c., to the STONETROUGH COLLIERY COMPANY, Lawton, Cheshire.

MINING IN CARDIGANSHIRE.—TO CAPITALISTS.

THE ADVERTISER HAS PROCURED A LEASE, upon highly advantageous terms, of a SILVER-LEAD MINE situated in the richest mineral district of CARDIGANSHIRE, and is DESIROUS OF OBTAINING THE CO-OPERATION OF A FEW PRIVATE CAPITALISTS efficiently to work the same. It is considered £4000 will be amply sufficient fully to develop the property, erect the requisite machinery, and bring the mine into a dividend-paying state. Unlimited water-power at hand. Application addressed to "H. G." Mining Journal office, 26, Fleet-street, London, E.C., will receive prompt attention.

FOR SALE, A VALUABLE TIN MINE IN CORNWALL.

Reports in detail may be seen from Captain John Edwards, late of Tywarthall Mine, and all other necessary information received, at the Mining Offices, 63, Cornhill, London.

FOR SALE, TREGULLOW CONSOLS MINE, situated in the

parish of St. Agnes, adjoining North Trekerby, North Hallenbeagle, and Scorrer Consols Mines, in one of the richest mineral districts in Cornwall. The above mine, with the tin lode at surface, together with the materials thereon, are to be sold to pay the labour cost, lord's rent, and other liabilities.—Apply to Capt. JOHN DALE, managing agent, mining offices, 63, Cornhill, London.

JOHN DALE, St. Stephen's, St. Austell, Cornwall.

BLUE HILLS COLLIERY COMPANY.—Notice is hereby given,

that the SHARE LIST of this company will be CLOSED on the 10th inst.

UNITED MEXICAN MINING ASSOCIATION.—Notice

is hereby given, that the FINAL PAYMENT OF TWENTY PER CENT. ON THE NEW LOAN raised under the resolutions of the special general meeting of the proprietors, held on the 25th day of January, 1861, will be PAYABLE at the company's office, No. 5, Finsbury-circus, on and after Friday, the 13th day of December inst. The interest, at the rate of 5 per cent. per annum, accruing to that date will likewise be paid.

Notice is hereby further given, that the BONUS at the rate of TWENTY-FIVE PER CENT., in virtue of the 8th clause of the said resolutions, will also be PAYABLE at the same time.

The scrip issued by the association must be delivered at the office two clear days before payment is made, and will be retained and cancelled.

Hours of payment, from Eleven to Three.

By order of the Directors, W. M. BROWNE, Sec.

London, December 3, 1861.

TINCROFT MINING COMPANY.—Notice is hereby given, that

A DIVIDEND OF FIVE SHILLINGS PER SHARE (being the thirtieth) has this day been declared on the shares in this company, payable forthwith.

December 5, 1861. By order of the Board, HIRAM WILLIAMS, Sec.

N.B.—Certificates must be left at the office of the company, 1, Winchester-buildings, Old Broad-street, London, E.C., ten days, in order to be examined and marked.

WEST DEVON CONSOLIDATED COPPER MINING COMPANY (LIMITED).—Notice is hereby given, that a CALL OF TWO

SHILLINGS AND SIXPENCE PER SHARE has this day been made on the shareholders in this company, PAYABLE at the London and Westminster Bank, Lothbury, on or before the 30th day of December inst.

By order, W. S. TROTTER, Sec.

Offices, 1, Great Winchester-street, London, E.C., December 4, 1861.

MR. WM. HENDERSON has REMOVED from Alderley Edge to

LONDON, and from the extremely favourable results obtained by two years now in operation on Spanish and Cornish copper ores, he is now in a POSITION TO FURNISH EVERY INFORMATION ON THE WORKING OF HIS PROCESSES ON EVERY VARIETY OF POOR COPPER ORES. Silver, gold, cobalt, nickel, and tin ores can also be treated to great advantage.

MR. HENDERSON IS PREPARED TO GRANT LICENSES to any extent, and to UNDERTAKE THE PROFITABLE REDUCTION OF COPPER ORES, if above 1 per cent. produce, and in sufficiently large quantities.

Parties desirous of seeing their own ores operated upon, to the extent of 50 tons, can be accommodated on reasonable terms.

All communications to be addressed to 44, Addison-road, Kensington, W.

MR. J. SYKES, LEAK, STAFFORDSHIRE.

is in a position to DEAL SPECIALLY in RIBDEN and DALE SHARES. Reliable information.

FOR SALE:—30 Dale, 14s. 6d.; 150 Ribden, 4s. 9d.; 10 Great Retallack, 17s. 6d.; and 10 Wheel Wholly.

BUYER of Dale, Ribden, Lady Bertha, North Robert, Wheel Grenville.

Money at 4½ per cent. per annum, and 10 per cent. on the balance of which will be found in the advertising columns. Nearly the whole of the shares are applied for. The shares will go to a premium of 300 per cent. in less than twelve months.

Bankers: Leek Bank.

BRITISH AND FOREIGN STOCK, RAILWAY, AND MINING

SHARES BOUGHT AND SOLD BY MESSRS. FULLER AND CO., No. 26, CHANGE ALLEY, CORNHILL, LONDON. The holders of stock are invited to communicate with them, either for the purchase or sale of such stocks.

Messrs. FULLER and Co. call special attention to the present favourable opportunity of investing in British mines, being perfectly free from risk, and paying 15 to 30 per cent. Also, a few progressive mines, upon which 250 to 500 per cent. profit may be realised in a few months. Telegraphic messages promptly attended to.

Bankers: Bank of England.

MESSRS. FULLER AND CO., 26, CHANGE ALLEY,

CORNHILL, LONDON, are in a position to PURCHASE FOYALS BONDS and LAND WARRANTS, the holders of which are invited to submit any portion of £250,000 Five per Cent. Bonds, £250,000 Three per Cent. Bonds, and £500,000 Land Warrants. Cash paid on delivery.

In the Court of the Vice-Warden of the Stannaries.

Stannaries of Cornwall.

IN RE EAST ALFRED CONSOLS MINE.

TO BE SOLD, pursuant to an order made in a Cause of Painter

v. Oliver and another, dated the 8th day of June last, BY PUBLIC AUCTION, at the Registrar's office, Truro, on Wednesday, the 11th day of December inst., at Twelve o'clock at noon precisely.

34 (4096th) SHARES of the defendant Edward Oliver,

Of and in the said MINE. HENRY SEWELL STOKES, solicitor, Truro

(Agent for Roscorla and Davies, plaintiffs solicitors, Penzance).

Dated Registrar's Office, Truro, December 4, 1861.

RHONDDA, GLAMORGANSHIRE.**MR. W. H. HARRIS WILL SELL, BY AUCTION, at the New**

Inn, Pontypridd, on Monday, the 9th day of December next, at Three o'clock in the afternoon, subject to such conditions as shall be then produced, all that colliery known as the MERTHYR COLLIERY, situated at Abergorki, in the Rhondda Valley.

This colliery is situated on the Rhondda-fawr branch of the Taff Vale Railway, is distant from the shipping port of Cardiff 22½ miles, and is in direct communication with the narrow gauge system of the West Midland and other railways.

The coal field has an acreage of 368 acres, or nearly held under the trustees of the Marquis of Bute, for a term of 42 years, from the 29th September, 1858, at a dead rent of £300 a year, payable half-yearly, and at the following royalties:—

Large marketable coal..... 8d. per ton of 2520 lbs.

Small coal, sold or used..... 4d. " "

Argillaceous ironstone..... 8d. " "

Blackband, 8d. and 1s., according to the thickness, and fire-clay and building stones at fair rates.

Three levels have been opened upon the property, and, practically, the whole of the coal lies to the rise of these levels.

The vein of coal now worked has a thickness of coal of 3 ft. 6 in., of first-rate quality, and lies at an inclination of about 3 in. on the yard.

There are large and convenient blacksmiths and carpenters' shop, storehouse, office, stables, and cottages, with large enclosed yard, weigh-house, machine, screens and sheds, good sliding accommodation, and everything necessary for the working of the colliery. The whole work is now in excellent condition for working and sending away a

THE TANYBWLCH SLATE QUARRY, LLANLECHID, BANGOR, NORTH WALES.—This quarry has only very recently been opened by the owner, and although the operations have been very limited the quantity of slates obtained has been very considerable, and of superior quality.

The quarry is situated within two miles of the Penrhyn Slate Quarries, the property of the Hon. Col. E. G. Douglas Pennant, M.P., and has every facility for the conveyance of the slates to the town and port of Bangor, distant four miles, and thence by rail and ship transit.

A report of the capabilities of the quarry has recently been made by an experienced practical surveyor, a copy of which will be forwarded on application to the owner of the quarry, Mrs. TAYLOR, Albion Hotel, Bangor, of whom particulars as to terms of letting can be obtained.

ST. JUST UNITED TIN AND COPPER MINING COMPANY (LIMITED), IN THE PARISH OF ST. JUST, NEAR PENZANCE, IN THE COUNTY OF CORNWALL.

Incorporated under the Joint Stock Companies Acts, 1856 and 1857.

Capital £15,000, in 6000 shares of £2 10s. each. Deposit on application 5s., and 5s. on allotment.

DIRECTORS.

JAMES WRIGHT, Esq., C.E., 42, New Bridge-street, Blackfriars, London.

Col. BUSH, 55, York-terrace, Regent's-park, London.

THOMAS COOPER SMITH, Esq., 8, Warrington-court, Throgmorton-street, London.

Capt. GOLDICUTT (late 60th Rifles), Barton Villas, Barnsbury, London.

WESTWORTH LASCELLES SCOTT, Esq., M.S.A., Westbourne-park, Bayswater, London.

WILLIAM GREEN, Esq., Beverley-road, Hull, Yorkshire.

GEORGE EUSTICE, Esq., C.E., Hayle, Cornwall.

BANKERS—Roberts, Lubbock, and Co., 11, Mansion House-street, London.

Batten, Carne, and Carne, Penzance, Cornwall.

BROKER—Alexander Young, Esq., 3, Bartholomew-lane, or Stock Exchange, City, London.

SOLICITORS—Messrs. Hancock, Sharp, and Hales, 20, Tokenhouse-yard, City, London.

AUDITORS—Messrs. Cooper Brothers and Co., 13, George-street, Mansion House, London.

SECRETARY—Mr. E. Evans.

OFFICES—23, MOORGATE STREET, CITY, LONDON.

This company is established for purchasing and working the extensive and valuable tin and copper mines, called the St. Just United, in the parish of St. Just, near Penzance, Cornwall, and situated in a district which is one of the most productive in the country, and has become distinguished by the rich returns and profitable results of mining operations carried on within it. The undermentioned mines, which are producing immense quantities of ores, and continue paying large dividends to the shareholders, are immediately adjoining and contiguous to the one under notice:—

Names of Mines now working, paying dividends.	Shares	Amount paid per share.	Dividends paid per share.	Original outlay.	Total Ammt. of dividends paid.	Present market value.
Levant (tin & cop.)	160	£2 10 0	£1091 0 0	£400 0 0	£174,560 0	£16,000 0
Botalack (tin & cop.)	200	£1 5 0	£445 10 0	£1,250 0 0	£80,150 0	£48,000 0
Wheal Owles (tin)	80	£0 10 0	£280 10 0	£5,600 0 0	£22,452 0	£24,000 0
Balsawidden (tin)	1624	£1 15 0	£12 5 0	£19,082 0 0	£19,894 0	£19,488 0
Boscan (tin)	240	£20 10 0	£33 0 0	£4,920 0 0	£7,920 0	£12,000 0
Spearne Moor (tin)	280	£11 7 6	£9 15 0	£8,928 0 0	£2,730 0	£12,000 0
Carnyorth (tin)	2948	£3 10 0	£0 19 6	£7,168 0 0	£1,996 16	£7,168 0
	4632	£21 7 6	£1873 7 6	£64,348 0 0	£318,712 16	£139,256 0

* Decomposed granite, slate, and greenstone. † Decomposed granite.

The above seven mines, on an outlay of £64,348 on the present working, have already paid back in dividends to the shareholders £318,712 16s.

As the before-mentioned mines stand prominent in the dividend-paying list, it may not be out of place to state also that Botalack Mine has given back to the shareholders in its former workings upwards of £250,000; Boscanwell Downs Mine upwards of £40,000, and again resumed working by a new company; Wheal Canning upwards of £25,000; Boscan Mine upwards of £15,000; and Spearne Moor Consols for an outlay of £1280 upwards of £10,000; thus making a total sum five mines have paid back in dividends to shareholders of £340,000.

Names of mines working.	Shares	Original outlay.	Market value.	Geological position.
Pendone Consols (cop.)	5000	£18,000 0 0	£28,780 0 0	granite, slate, & greenstone.
Boscanwell Downs (tin)	1248	7,800 0 0	9,984 0 0	granite.
Wheal Hearle (tin)	1024	7,680 0 0	15,360 0 0	granite.
Boswell (tin)	123	3,936 0 0	3,936 0 0	granite and greenstone.
Boscan (tin)	160	1,000 0 0	1,600 0 0	granite.
		£38,416 0 0	£59,660 0 0	

The mines are very extensive on the course of the lodes, and have been granted at the very moderate royalty of 1-24th dues for the term of 21 years, and upon the usual mining conditions. Fourteen rich tin and copper lodes and three cross-courses pass through this ground; some of these lodes have been wrought on, and so far as they have been opened, have proved very productive, and will, no doubt, at a deeper level prove richer and lasting in their downward courses. This, in fact, has actually been the result in every mine in the district.

The geological position of this extensive and valuable mining property cannot be surpassed in the country. It is in beautiful strata, quite congenial for producing tin in the granite, and copper in the (slate) immediately adjoining the granite, precisely of the same character as Botalack, Levant, Pendone Consols, and other mines in the district.

These mines lie immediately adjacent to the rich Botalack, Levant, and other mines, all making large dividends, and producing tin in the granite inland, and copper ore in the hills under the sea. All these mines exist under such geological parallels, that it is almost impossible to overlook the fact that they cannot fall under good management, become highly profitable; so much so, that in a low catalogue of all the surrounding mines, not one but has proved a most excellent investment for capital.

With reference to these special mines, the lodes in them which have been worked for tin for centuries have proved so profitable that the waste heaps seem inexhaustible, and after being worked over the third or fourth time are now affording great profits.

There are very large quantities of tin now lying underground, which were broken when that metal was worth about £40 per ton, but is now worth £76 per ton, and may consequently now be prepared for market at considerable profits.

There is an immense field of tin ground, containing 14 lodes, in the grant. These have been partially worked to an inconsiderable depth, about 60 fms., under adit; affording evidence that there remains an unlimited supply below, which may be worked to extraordinary profits under the favourable circumstances of the prevailing high prices of tin, low prices of mining materials, and the improved steam-power of the age.

Some very beautiful specimens of blistered copper ore may be seen in the offices of the company, broken in the last day or two of working in the 40, by the last workers; but the levels, although close to the copper formation, have not been carried into it, and some idea of its extent and value may be formed from the evidence of a similar range of copper ore ground worked in Botalack Mine, which has given as much as £24,000 per annum profit.

There can be no doubt that this property is actually teeming with certain and abundant mineral wealth, as it is the decided opinion of persons competent to speak on the mine, that when it shall have been set to work the profits that will accrue therefrom will place it in a position second to none in the district for the outlay.

The directors, after an unusually rigid enquiry and careful inspection of these mines, have the greatest confidence in bringing this property before the public, and they feel satisfied, by established facts, that a more promising and advantageous investment, and one more free from any speculative feature, has never before been offered to the public.

A reference to the section and sketch of the adit will better illustrate the position of the lodes of these mines.

The opinions of several mining engineers that have been consulted on the subject are, that a steam engine of 36 in. cylinder and rotative expansive machine, for pumping and stamping may be erected, and the mine drained, for about £5000, when it is estimated that a small additional sum will carry the 40 and 62 westward into the copper ore ground, so as to give dividends to the shareholders almost at once, or at any rate within a very short period afterwards.

The capital of the company will consist of £15,000 in 6000 shares of £2 10s. each, deposit 5s. per share on application, 5s. per share on allotment, and the future calls will not exceed 5s. per share at any one time.

The conditions of purchase for this valuable property are £2000 in cash, and £3000 in 1000 shares, the consideration for which embraces a lease of 21 years on highly favourable terms, the benefit of the work already done, with the plant, houses, materials, and means upon the mine; this will leave £10,000 for working capital, which is considered more than ample to carry out all the work necessary to place the mine in a dividend position.

The company having been completely registered with Limited Liability, no shareholder can, under any circumstances whatever, be made responsible for a greater amount than the shares to which he subscribes.

There are no special Articles of Association. Table B under the Joint-Stock Companies Act of Parliament having been adopted in its entirety.

To insure subscribers for any loss which may ensue when a sufficient number of shares are not applied for by the directors bind themselves to return the whole of the deposit money, unless at least one-half of the shares are subscribed for.

A considerable portion of the capital has been already subscribed, and the directors will proceed to allot the shares as soon as they deem the requisite number applied for.

It is unnecessary to enter into further particulars in the prospectus, as the annexed reports of mining engineers and practical agents of the highest standing in the district, who have inspected these mines, will sufficiently corroborate the statements herewith submitted.

Some fine specimens of the ores from the various lodes may be seen at the offices.

Prospectuses, plans, forms of application for shares, and any other information, may be obtained of the secretary at the offices of the company, or from ALEXANDER YOUNG, 3, Bartholomew-lane, London.

LAKE SUPERIOR, U.S.—Mr. G. W. HAMBLIN, Post Master, Negawee Post-office, Marquette County, Lake Superior, U.S., has opened an office as above, for the purpose of supplying mineralogical specimens generally, but more particularly such as are peculiar to the district, to museums and collectors throughout the world. From his acquaintance with the different localities on the Lake, and with mining operations, he has facilities for collecting minerals, also for procuring the rarer sorts. Residing in the centre of the iron district, Mr. Hamblin can furnish specimens of ores of beauty as cabinet specimens, of which the mammillary and stalactitic forms of hematite are worthy a place in any cabinet. He can also supply specimens of native copper and silver, with the accompanying minerals, many of which occur as crystals, forming rare objects of interest to the collector. Collections made up of all sizes and states of completeness, from the value of \$25 (or £5 sterling) to \$300. Letters of enquiry or conveying orders must be post paid.—P.S.—On receipt of £5 sterling Mr. Hamblin will forward a set of iron specimens; also, native copper and silver.

Crystals as follows will be supplied at from \$2 to \$4 each:—Quartz, calc spar (Dog Tooth and other varieties), epidote, greenstone, prehnite (with copper), black oxide copper, calcite, chlorastrolite (found only at Isle Royale), native copper (crystallized), calc spar (with radiated epitaxite), ripple marked quartz (from the metamorphic strata), and a large variety of others illustrative of the geology and mineralogy of this part of the world. On account of the expense of remittance, the smallest collection which can be forwarded will be \$25 (or £5 sterling).

RAILWAY WAGONS.—WILLIAM A. ADAMS AND CO., MIDLAND WORKS, BIRMINGHAM.

BROAD AND NARROW GAUGE COAL AND IRONSTONE WAGONS.

IN STOCK—FOR SALE OR HIRE.

RAILWAY WAGONS.—WILLIAM HARRISON AND CAMM HAVE ON HAND RAILWAY, COAL, COKE, AND MINERAL WAGONS, ON SALE OR HIRE, AT THE ROTHERHAM WAGON WORKS, MABRO.

THE BIRMINGHAM WAGON COMPANY (LIMITED) HAS RAILWAY WAGONS FOR HIRE.

Apply to the SECRETARY, 3, Newhall-street, Birmingham.

THE RAILWAY CARRIAGE COMPANY, OLDBURY, NEAR BIRMINGHAM.

MANUFACTURERS OF EVERY DESCRIPTION OF RAILWAY PLANT AND IRONWORK.

NEW AND SECOND-HAND RAILWAY WAGONS ALWAYS IN STOCK FOR SALE OR HIRE.

LONDON OFFICES.—No. 1, MOORGATE.

ELECTRIC TELEGRAPH CONTRACTORS SUPPLIED with MALLEABLE IRON CASTINGS to pattern.

T. SHORT AND CO., 70, LEGGE STREET, BIRMINGHAM.

RAILWAY CONTRACTORS SUPPLIED with MALLEABLE IRON CASTINGS to pattern.

T. SHORT AND CO., 70, LEGGE STREET, BIRMINGHAM.

IRON PLATE WORKERS, BRAZERS, AND GALVANIZERS SUPPLIED with MALLEABLE IRON NIPPLES for SUGAR CONES to pattern.

T. SHORT AND CO., 70, LEGGE STREET, BIRMINGHAM.

NOTICE TO RAILWAY COMPANIES.—A RAILWAY SIGNAL of a NOVEL DESCRIPTION (patented) is NOW IN OPERATION on the MANCHESTER AND ALTRINCHAM RAILWAY, which GIVES NOTICE of the APPROACH of a TRAIN HALF A MILE OFF, and, if required, can announce it at any other given distance. It is novel and simple in its construction, not a single complicated movement in it, and when laid down will not require repairs for years. A model may be seen at the Mining Journal office, 26, Fleet-street, London, in the course of a week, and a gentleman will shortly call on the different railway companies centering in the metropolis to give any required explanations.

TRACTION ENGINES FOR STEEP INCLINES.

It is proposed to form a limited company, with a capital of £7000, in 70 shares of £100, for the purpose of bringing into use the protected invention of Mr. John Marshall, C.E., by means of which engines can be constructed for the conveyance of from 10 to 50 tons, according to size and weight, on ordinary roads having an inclination as steep as 1 in 4.—Specifications, with formula, on application to L. C. HERTLEY, Esq., 448 West Strand, London.

STEAM ENGINE FOR SALE.—A 36 in. cylinder STEAM ENGINE FOR SALE, equal to new, with 10 ton BOILER, to be seen at Wheal Trevelyan Mine, Goldsmithy, near Marazion.—For further particulars, apply to Mr. E. KING, 27, Austinfriars, London.

TRADE MARK

JAMES RUSSELL AND SONS, CROWN TUBE WORKS, WEDNESBURY, STAFFORDSHIRE.

WAREHOUSE.—81, UPPER GROUND STREET, BLACKFRIARS, LONDON; S. THE ORIGINAL INVENTORS OF WROUGHT IRON TUBES FOR GAS, WATER, &c. LAP-WELDED BOILER TUBES, HOMOGENEOUS TUBES FOR BOILERS, &c. GALVANIZED AND ENAMELLED TUBES, SCREWING TACKLE, STEAM AND WATER GAUGES, AND EVERY VARIETY OF FITTINGS.

JOB TAYLOR AND CO., SWAN FOUNDRY, OLDBURY, NEAR BIRMINGHAM.

SOLE PROPRIETORS OF HINTON'S PATENT CUPOLA, which CONSUMES FIFTY PER CENT. LESS COKE than any cupola yet invented. MAKERS OF ALL KINDS OF MACHINERY connected with the GRINDING and TEMPERING OF EVERY SORT OF CLAY or MARL, and for the MANUFACTURE OF BRICKS, TILES, DRAIN PIPES, &c. Also, of HIGH and LOW PRESSURE STEAM ENGINES of any dimensions, and of GENERAL MACHINERY.

LLOYD AND LLOYD, ALBION TUBE WORKS, BIRMINGHAM.

MANUFACTURERS OF PATENT LAP-WELDED IRON TUBES, FOR LOCOMOTIVE, MARINE, AND STATIONARY BOILERS.

IMPROVED HOMOGENEOUS METAL TUBES.

ALL DESCRIPTIONS OF TUBES AND FITTINGS FOR GAS, STEAM AND WATER, PLAIN, GALVANIZED AND ENAMELLED.

GUN-METAL STEAM GLAND COCKS, WATER GAUGES, &c.

SHORTIDGE, HOWELL, AND CO., HARTFORD STEEL WORKS, SHEFFIELD, SOLE MANUFACTURERS OF HOWELL'S PATENT HOMOGENEOUS METAL PLATES FOR BOILERS, LOCOMOTIVE FIRE BOXES, AND TUBES, COMBINING THE STRENGTH OF STEEL with the MALLEABILITY OF COPPER. RUSSELL AND HOWELL'S PATENT CAST STEEL TUBES. MCCONNELL'S PATENT HOLLOW RAILWAY AXLES.—For prices and terms, apply to SHORTIDGE, HOWELL, and Co., Hartford Steel Works, Sheffield; or Messrs. HARVEY and Co., 12, Haymarket, London.

CORNISH BORER STEEL.—Upwards of ONE HUNDRED AND SIXTY MINES are SUPPLIED with this STEEL, and the DEMAND for it is RAPIDLY INCREASING.—For terms, apply to R. MURKET and Co., Forest Steel Works, near Coleford, Gloucestershire.

CYANOGEN STEEL, CAST STEEL, SHEAR STEEL, and IMPROVED FOREST L BLISTER STEEL supplied to order by ROBERT MURKET and Co., Forest Steel Works, near Coleford, Gloucestershire. Address to the Works, Coleford.

NICKEL AND COBALT REFINING, AND GERMAN SILVER WORKS, 16, OZZELL STREET NORTH, BIRMINGHAM.

STEPHEN BARKER begs to inform the Trade that he has the following articles for sale:—REFINED METALLIC NICKEL. OXIDE OF COBALT. (WIRE, &c.) REFINED METALLIC BISMUTH. GERMAN SILVER—IN INGOTS, SHEET NICKEL AND COBALT ORES PURCHASED.

GOLDENHILL, COBALT, NICKEL, COLOUR, BORAX, AND CHEMICAL WORKS, NEAR STOKES-UPON-TRENT, STAFFORDSHIRE.

JOHN HENSHALL WILLIAMSON, MANUFACTURER AND REFINER. Reference.—Professor Miller, King's College, London.

PATENT MOVABLE FIRE BAR COMPANY (LIMITED).

DIRECTORS.

SAM'L H. BLACKWELL, Esq., Ironmaster, Dudley.

SAM'L THORNTON, Esq., Merchant, Birmingham.

JONATHAN GRINDROD, Esq., C.E., Liverpool.

JOHN LLOYD, Esq., Engineer, Lillishall.

OFFICES.—16, HACKIN'S HEY, LIVERPOOL.

WRIGHT'S PATENT BARS FOR LOCOMOTIVE, MARINE, AND STATIONARY BOILERS, PUDDLING AND OTHER FURNACES.

The proprietors have great pleasure in recommending the above as the simplest and best arrangement in use. The bars have already been adopted by some of the leading firms in the Midland and Lancashire and Lancashire and Lancashire, and the large breweries in Burton, and have, in every case, given great satisfaction.

For prices charged, apply at the company's office, Liverpool.

AGENTS WANTED; also, TENDERS from Ironfounders for CASTING the BARS.

TO COAL OWNERS AND COKE BURNERS.

MACKWORTH'S PATENT COAL WASHER, OR PURIFIER.—This MACHINE will EXTRACT the HALE and ALL HEAVY IMPURITIES from SMALL COAL at a COST of TWOPENCE PER TON.—For particulars and references, apply to the makers, A. and T. FAY, Temple-gate Works, Bristol; or to Mr. JOE RIDER, Basinghall-street, Leeds.

CREASE'S PATENT EXCAVATING MACHINERY, for SUPERSEDING the SLOW and EXPENSIVE USE of MANUAL LABOUR in SINKING SHAFTS, DRIVING LEVELS, TUNNELLING, &c., is guaranteed to drive through any rock of average hardness at a minimum rate of 1 fm. per diem, and to sink shafts at the rate of 2 fms. in three days.

Mr. CREASE will undertake contracts for sinking shafts, driving levels, &c., at an enormous reduction of time and great saving in cost.

Applications to be addressed to Mr. GEORGE T. CURTIS (sole agent), 17, Gracechurch-street, London, E.C.

By providing the power of calculating the time and cost to explore a certain depth and extent of ground, speculation in mining will be assimilated to commercial pursuits, with this unmistakable advantage—that when the ground has been once carefully and judiciously selected, and operations properly and systematically carried out for its development, there would be far less chance of unsatisfactory results than are met with by merchants and manufacturers in the usual routine of their business. As this important invention must beneficially interest the landowners, mine proprietors, merchants, and miners, we opine it will meet with immediate adoption.—Mining Journal.

BELL BROTHERS beg to intimate that, having become SOLE LICENSEES in the United Kingdom of PROF. DEVILLE'S METHOD OF PRODUCING PURE ALUMINIUM, they are now in a POSITION to SUPPLY, from their works here, both this metal and its compound with copper, known under the name of ALUMINIUM BRONZE.—Newcastle-on-Tyne, September, 1860.

HALL AND WELLS, PATENTEES AND MANUFACTURERS OF SUBMARINE TELEGRAPH CABLES, CABLES, &c.—TELEGRAPH CONDUCTORS INSULATED with INDIA RUBBER at £5 per mile and upwards, PARTICULARLY ADAPTED for MINING PURPOSES. Further particulars as to price of cores, cables, &c., can be had on application at 60, Aldermanbury, City, E.C.; and Steam Mills, Mansfield-street, Borough-road, Southwark, S.E. Copper wire covered with silk, cotton, or any other material, to order.

TO INVENTORS.—All INTENDING PATENTEES should PROCURE the PRINTED INFORMATION regarding PATENTS, their COST, and the MODE of PROCEDURE to be adopted, ISSUED GRATIS by the GENERAL PATENT COMPANY (LIMITED), 71, FLEET STREET, LONDON.

H. MARSDEN LATHAM, Sec.

BEDFORD IRONWORKS, TAVISTOCK.

NICHOLLS, WILLIAMS, AND CO. have generally a GOOD STOCK of SECOND-HAND MINING MATERIALS FOR SALE. They also MANUFACTURE STEAM ENGINES of every description on the newest principle. Castings and wrought-iron work made at the shortest notice. Machinery sent to all parts of the world. Steam boilers and chains warranted of the best description.

AYTOUN'S PATENT SAFETY CAGE AND HOIST.

CHANGE OF LICENSE FEE WILL SHORTLY TAKE PLACE, from £1 to £3 and upwards.

[See Mining Journal of November 29.]

Apply to the patentee, ROBERT AYTOUN, 3, Petes-row, Edinburgh.

PATENT SAFETY FUSE.—The GREAT EXHIBITION PRIZE MEDAL was AWARDED to the MANUFACTURERS of the ORIGINAL SAFETY FUSE, RICKFORD, SMITH, DAVEY, and PRYOR who beg to inform Merchants, Mine Agents, Railway Contractors, and all persons engaged in Blasting Operations, that, for the purpose of protecting the public in the use of a genuine article, the PATENT SAFETY FUSE has now a thread wrought into its centre, which, being patent right, infallibly distinguishes it from all imitations, and ensures the continuity of the gunpowder. This Fuse is protected by a Second Patent, is manufactured by greatly improved machinery, and may be had of any length and size, and adapted to every climate.

Address:—RICKFORD, SMITH, DAVEY, and PRYOR, Tuckingmill, Cornwall.

SAFETY FUSE.—Messrs. WILLIAM BRUNTON AND CO., PENZANCE, POOL, NEW CORNWALL, and BRYMBO, near WREXHAM, MANUFACTURERS OF FUSE, of every size and length, as exhibited in the Great Exhibition of 1851, and supplied to the Royal Arsenal at Woolwich, the Arctic Expedition, and every part of the globe.

For the convenience of their customers and others in the North, W. BRUNTON and Co. have recently erected a branch manufactory at Brymbo, near Wrexham, where, as at Cornwall, they are at all times PREPARED to EXECUTE UNLIMITED ORDERS for SUPPLYING FUSE upon warrant that it will prove equal to, if not better than, any to be procured elsewhere.

DAVEY'S PATENT BLASTING POWDER, MANUFACTURED BY DAVEY BROTHERS AND CO., NANCEKEU POWDER WORKS, TUCKINGMILL, CORNWALL.

This blasting powder possesses the following advantages over every other in use:—Its COMBUSTION is SLOWER and MORE PERFECT when confined in the hole, PRODUCES LESS SMOKE, is LESS DANGEROUS, and it generally BURSTS MORE ROCK with a CHARGE OCCUPYING the SAME SPACE, but WEIGHING FROM TWENTY to THIRTY PER CENT. LESS than other powder, EFFECTING an IMPORTANT SAVING.

DAVEY BROTHERS and Co. beg to state that this powder is specially made for blasting, and from its slow combustion is not adapted for projectiles. They would, therefore, caution consumers against the efforts of interested parties to put it to a fallacious trial, by firing a ball from a mortar, which is no test of its explosive force when confined.

MINERS' DIALS, LEVELS, ANEMOMETERS, PIT BAROMETERS, &c.

DIALS WITH THE LATEST IMPROVEMENTS.

APPOINTED MAKER OF HEDLEY'S DIAL.

BIRAM'S PATENT ANEMOMETER, 4 in., £2 10s.; 6 in., £3 3s.; and 12 in., £4 4s.

JOHN DAVIS, DERBY, MANUFACTURER OF MINING INSTRUMENTS.

Price list on application.

PATENT LEVER BREAK, FOR RAILWAY WAGONS, doing away with the objectionable break rack. Can be APPLIED to EXISTING STOCK at a TRIFLING EXPENSE. Royalty moderate. Models can be seen at No. 1, Moorgate, London, E.C.; and the breaks in action at the works of the Railway Carriage Company; at the Peterboro' Station, on the Eastern Counties Railway; the Rugby Station, London and North-Western Railway; the Cardiff Docks Station, Taff Vale Railway; and at the Works, Oldbury, near Birmingham, where all communications are requested to be sent.

GOLD GETTING MACHINES, for Nova Scotia. Also, the NEW PATENT HYDRAULIC PRESS, important to shippers, packers, and seed crushers, weighing only a few hundredweights instead of tons. Can be seen at the patentee's, J. WALKER, 17, Cowper-street, City-road.

WIRE-ROPE TESTING.

PUBLIC TEST OF A. J. HUTCHINGS AND CO.'S PATENT WIRE-ROPE at LIVERPOOL, FEBRUARY 27, 1861.

[From the Daily Post of March 1, 1861.]

On Wednesday, the 27th of February, a series of EXPERIMENTS on WIRE-ROPE took place at the Corporation Testing Works, King's Dock. The specimens tested were manufactured by the well-known firm of A. J. HUTCHINGS and Co., of Millwall, London, the Corporation of the Admiralty and various foreign Governments, the character of whose rope is well known in this country as well as all parts of the Continent. Capt. Duffaut, of H.M.S. Hastings, and a number of other gentlemen connected with shipping, were present to witness the experiments, all of which were considered highly satisfactory, and in every respect sustained the reputation of the manufacturers. The following are the results of the experiments:—

An 8 in. rope bore 70 tons WITHOUT BREAKING. Circumference and breaking strain.

Size.	Hutchings and Co.'s wire-rope for ships' rigging. Tested Feb. 27, 1861.	Newall and Co.'s Test of Oct. 29, 1860.	Garnock, Bibby, and Co.'s Test, Oct. 29, 1860.
2 1/2	5 tons 15 cwt.	—	8 tons 16 cwt.
3 1/2	11 " 14 "	7 tons 15 cwt.	—
4 1/2	16 " 10 "	—	18 " 5 "
5 1/2	22 " 8 "	16 " 10 "	—
6 1/2	29 " 10 "	18 " 15 "	—
7 1/2	37 " 15 "	—	26 " 10 "

N.B.—The 2 1/2, 3 1/2, and 4 in. ropes were the actual sizes tested. The remaining sizes and strains are comparative.

The above tests certified by Mr. McDonald the Superintendent of the Corporation Testing Works, Liverpool.

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THE MINING SHARE LIST.

DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Pr.	Business.	Dividends Per Share.	Last Paid.
4000	Bedford United (copper), Tavistock	2 6 8	5 5 4	5 5 4	12 8 6	0 1 0
240	Boscan (tin), St. Just	20 10 0	60	35 10 0	1 5 0	Dec. 1861
240	Botolph Claydon (copper), St. Just	21 5 0	230	443 5 0	2 10 0	Feb. 1860
240	Carn Breva (copper), Illogan	15 0 0	80	269 10 0	2 0 0	Feb. 1860
2048	Carnyorth (tin), St. Just	3 10 0	13 1/2	0 19 8	0 2 0	Sept. 1860
200	Cefn Cwm Brwyno (lead), Cardiganshire	33 0 0	33	9 0 0	4 0 0	April, 1861
50000	Connores (copper, sulphur) (L. £1)	1 0 0	34 1/2	0 9 0	0 9 0	July, 1860
2450	Cook's Kitchen (copper), Illogan	17 0 0	29 1/2	0 13 0	0 5 0	Sept. 1861
12000	Copper Miners of England	25 0 0	26	7 1/2 per cent.	—	Half-yearly
350000	Doitto (stock)	100 0 0	24	1 per cent.	—	Half-yearly
1065	Craddock Moor (copper), St. Cleer	8 0 0	20	6 3 0	0 7 0	Nov. 1861
867	Cwm Erdd (lead), Cardiganshire	7 10 0	21	6 3 0	0 15 0	Oct. 1861
128	Cynystaw (lead), Cardiganshire	60 0 0	200	231 10 0	4 0 0	Oct. 1861
280	Darwent Mines (all-lead), Durham	300 0 0	180	142 0 0	5 0 0	June, 1861
1024	Devon Gt. Con. (cop.), Tavistock	1 0 0	375	774 0 0	7 0 0	Nov. 1861
358	Dolowath (copper), Camborne	128 17 6	550	640 10 0	7 0 0	Oct. 1861
2000	Dyffryn (lead), Wales	12 6 0	10	0 5 0	0 2 0	Nov. 1861
512	East Basad (cop.), Redruth	29 10 0	65	93 0 0	3 0 0	Nov. 1861
5144	East Caradon (copper), St. Cleer	2 14 6	27 28	1 10 0	0 12 6	Oct. 1861
300	East Darren (lead), Cardiganshire	82 0 0	45	78 10 0	1 0 0	Oct. 1861
1400	Evan Mining Co. (lead), Derbyshire	5 0 0	—	0 8 1	0 10 0	May, 1861
4940	Foxdale Consols (copper), Tyeval	4 0 0	—	41 9 0	0 2 6	Jan. 1861
2900	Frank Mills (lead), Devon	3 18 6	43 1/2	64 12 7	1 12 0	Sept. 1861
6000	Great South Tolgus (S.E.), Redruth	0 14 6	4 1/2	7 13 6	0 5 0	Feb. 1861
1798	Great Wheel Fortune, Breage	18 0 0	13 1/2	1 0 0	0 10 0	July, 1861
5908	Great Wh. Vor (tin cop.), Helston	40 0 0	6 1/2	1 12 6	0 7 6	Sept. 1861
1024	Herodafot (id.), near Liskeard	8 10 0	38 39	16 5 0	0 15 0	Oct. 1861
1000	Hibernian Mine Company	92 6 2	27 1/2	7 10 0	0 15 0	Sept. 1861
160	Levant (copper), tin, St. Just	2 10 0	95	1091 0 0	5 0 0	May, 1860
400	Lisborne (lead), Cardiganshire, Wales	18 10 0	110	377 10 0	2 0 0	Oct. 1861
8000	Marke Valley (copper), Cardigan	8 10 0	10 1/2	2 1 0	0 6 0	May, 1861
6000	Mendip Hills (lead), Somerset	3 10 0	13 1/2	78 3 3	3 6 0	Nov. 1861
1000	Miners Mining Co. (L.) (id.), Wrexham	25 0 0	170	14 7 11	0 7 0	June, 1861
23000	Mining Co. of Ireland (cop., lead, coal)	7 0 0	16 1/2	15 5 7	0 18 0	Oct. 1861
640	Mount Pleasant, Mold	4 0 0	35	0 3 6	0 10 0	Sept. 1861
6000	New Birch Tor and Viller Consols	1 6 0	2 1/2	0 2 6	0 2 6	Aug. 1861
6000	North Downs (copper) Redruth	2 3 4	5 1/2	0 10 0	0 10 0	Mar. 1861
1366	North Grambler, Redruth	2 6 0	6	0 2 0	0 2 0	May, 1860
6000	North Great Work, Breage	1 3 0	1 1/2	0 8 1	0 13 0	Nov. 1861
6000	Orsed (lead), Flintshire	0 8 1/2	1 1/2	12 10 0	0 2 0	Sept. 1861
6400	Par Consols (cop.), St. Blazey	1 1/2	7 1/2	449 10 0	55 0 0	May, 1861
200	Parys Mine (copper), Llanfyllter	60 0 0	—	6 2 0	0 15 0	April, 1861
200	Phoenix (copper), tin, Llanfyllter	100 0 0	435	61 15 0	1 0 0	Nov. 1861
1772	Poiborro (tin), St. Agnes	—	5	1250 0 0	100 0 0	Quarterly
1120	Providence (tin), Uny Lelant	10 6 7	43	361 0 0	5 0 0	Nov. 1861
16	Rhosomart (copper), tin, St. Just	50 0 0	—	103 10 0	1 0 0	Nov. 1861
512	South Caradon (cop.), St. Cleer	1 5 0	335	357 5 0	0 0 0	Nov. 1861
512	South Tolgus (cop.), Redruth, Cornwall	8 0 0	45	9 15 0	0 10 0	June, 1861
496	South Wheel Fortune, Illogan	18 9 0	90	484 10 0	10 0 0	Nov. 1861
280	Spearhead Moor (tin, copper), St. Just	31 17 9	45	322 0 0	7 0 0	Jan. 1861
910	St. Ives Consols (tin), St. Ives	8 0 0	33	10 18 0	0 8 0	Dec. 1861
6000	Tamar Con. (all-lead), Helston	4 0 0	295	7 0 0	0 10 0	Sept. 1861
2000	Tinctor (cop., tin), Follifoot (S.E.)	9 0 0	7 1/2	52 0 0	2 0 0	May, 1861
472	Trellyn Consols (tin), St. Ives	11 10 0	16	8 15 0	1 0 0	Jan. 1861
200	Trumpet Consols (tin), near Helston	57 10 0	100	22 0 0	0 5 0	Sept. 1861
1024	Wendron Consols (tin), Wendron	11 13 10	10 1/2	14 10 0	3 0 0	June, 1861
6000	West Basad (copper), Illogan	1 10 0	14	11 10 0	1 0 0	Oct. 1861
60	West Burton Hill (lead), Yorkshire	60 0 0	—	99 11 3	1 0 0	Nov. 1861
1024	West Caradon (cop.), Liskeard	5 0 0	50 53	45 0 0	1 0 0	May, 1860
266	West Damsel (copper), Gwennap	37 0 0	52	0 14 0	0 2 0	May, 1861
8400	West Fowey Consols (tin and copper)	7 10 0	45 1/2	576 10 0	2 0 0	Oct. 1861
400	Wh. B. Seton (cop.), Camborne	47 0 0	295	929 0 0	2 0 0	May, 1861
512	Wheel Bass (copper), Illogan	5 2 6	77 1/2	26 0 0	0 10 0	Oct. 1861
264	Wheel Buller (cop.), Redruth	5 0 0	80	2400 10 0	5 0 0	Feb. 1861
2900	Wh. Clifford Amalgamated (cop.), Gwennap	30 0 0	31	11 10 0	1 0 0	Oct. 1861
2000	Wheel Falmouth and Sperris	2 5 0	8	8 0 0	0 10 0	Sept. 1860
128	Wheel Friendship (copper), Devon	50 0 0	90	11 10 0	1 0 0	Oct. 1861
512	Wheel Jane (silver-lead), Kew	3 10 0	18	8 0 0	0 10 0	Sept. 1860
1024	Wheel Kitty (tin), Uny Lelant	1 7 2	6 1/2	1 12 0	0 1 0	Oct. 1861
6000	Wheel Luddett (lead), St. Ives	2 10 8	29 1/2	70 0 0	1 0 0	June, 1860
898	Wh. Margaret (tin), Uny Lelant	9 17 6	43	54 7 6	0 10 0	Sept. 1860
100	Wheel Mary (tin), Helston	8 0 0	17	285 13 0	5 0 0	Nov. 1861
80	Wh. Mary Ann (id.), Mendenhall	8 0 0	17	43 17 6	2 0 0	Oct. 1861
5000	Wicklow (copper) (L.), Wicklow	5 0 0	56	—	—	—

[* Dividends paid every two months. † Dividends paid every three months.]

MINES WITH DIVIDENDS IN ABEYANCE.

700	Aberdovey (silver-lead), Merioneth	1 10 0	30	0 10 0	0 10 0	Mar. 1859
5120	Alfred Consols (cop.), Phillack	3 6 1/2	14 1/2	20 3 0	0 2 6	April, 1859
1264	Ballicawadden (tin), St. Just	11 10 0	12	12 8 0	0 5 0	Jan. 1854
1200	Brightdale & Froggatt Grove, Derbyshire	3 0 0	3 1/2	3 0 0	3 0 0	April, 1856
200	Brynford Hall (lead), Flintshire	18 10 0	25	14 0 0	2 10 0	Oct. 1860
2500	Central Miners (lead) (L. £2)	1 0 0	8 1/2	0 13 0	0 4 0	Sept. 1859
6000	Charlotte United, Perthshire	2 13 2	21 1/2	3 5 0	0 8 0	Sept. 1859
2000	Collicombe (copper), Lamerton	5 0 0	12	0 13 0	0 8 0	Sept. 1859
256	Conduroff (cop., tin), Camborne	20 0 0	70	85 0 0	2 0 0	June, 1857
356	Cop Hill (copper) Redruth	48 0 0	110	2 10 0	2 10 0	Sept. 1857
4076	Devon and Cornwall (copper)	5 6 3	6	0 10 0	0 2 6	Feb. 1859
672	Ding Dong (tin), Guisborough	39 2 6	15	16 7 6	1 10 0	Mar. 1857
12800	Drake Walls (tin, copper), Calstock	2 10 0	1	0 18 0	0 2 0	Sept. 1857
2048	East Falmouth (all-lead), Kenwyn, Kea	3 0 0	1 1/2	0 7 6	0 2 6	Jan. 1858
128	East Pool (tin, copper), Pool, Illogan	24 5 0	240	305 0 0	2 10 0	Aug. 1858
2048	East Wheel Lovell (tin), Wendron	2 13 0	—	0 5 0	0 5 0	July, 1859
6000	General Mining Co. for copper (cop.)	4 10 0	5 1/2	23 0 0	1 0 0	July, 1853
496	Grambler and St. Aubyn (cop.) (S.E.)	48 10 0	115	23 0 0	1 0 0	Feb. 1858
119	Great Work (tin), Gernoe	100 0 0	110	231 10 0	7 10 0	Feb. 1857
200	Harward United (lead), Flintshire	40 0 0	10	3 0 0	1 10 0	July, 1860
6000	Hingham Down Con. (cop.), Cals. (S.E.)	4 10 0	3 1/2	2 16 0	0 2 6	Nov. 1856
5000	Kelly Bray (lead, copper), Callington	4 0 0	21 1/2	0 6 0	0 2 0	Feb. 1860
90	Laxey Mining Company, Isle of Man	100 0 0	1200	1420 0 0	0 50 0	June, 1857
470	Newtownards Mining Co., Co. Down	60 0 0	35	66 0 0	1 0 0	Sept. 1858
700	North Kestrel (copper), Camborne	18 0 0	16	167 0 0	4 0 0	Sept. 1853
512	Roswarne United (cop., tin), Gwennap	6 4 1/2	22	33 10 0	1 0 0	Sept. 1860
12000	Sporting Mines Company, Chilly (S.E.)	1 0 0	8	280 0 0	7 0 0	July, 1857
6000	South Grinnell (copper), St. Austell	19 0 0	128 1/2	60 0 0	20 0 0	Sept. 1858
20000	St. Day United (tin and cop.), Redruth	2 7 0	3 1/2	0 3 6	0 1 0	Feb. 1858
8000	Tolvadden (copper), Marazion	0 6 0	2	0 13 0	0 3 0	Mar. 1860
20000	Vale of Towy (lead), Carmarthen	13 6 1/2	3 1/2	0 5 0	0 1 0	July, 1858
1024	West Providence (tin), St. Erth	16 10 0	34 1/2	23 1 0	10 0 0	April, 1857
240	Wheel Bal (tin), St. Just	15 0 0	16	4 0 0	1 0 0	Feb. 1859
4096	Wheel Edward (cop.), Calstock	7 6 1/2	3 1/2	0 5 0	0 5 0	Mar. 1858
1024	Wheel Grylla (tin), Perranaruthven	2 4 0	16 1/2	1 12 0	0 7 6	Nov. 1859
6000	Wheel Kitty (tin), St. Agnes	4 16 6	1	0 18 0	0 2 0	July, 1860
512	Wheel Lovell (tin), Wendron	53 0 0	9	1 10 0	1 0 0	Sept. 1856
1024	Wheel Margery (tin, copper), Camborne	68 10 0	9	131 15 0	10 0 0	May, 1859
396	Wheel Seton (tin, copper), Camborne	68 10 0	121	43 15 0	1 0 0	Oct. 1860
1040	Wh. Trelawny (all-lead), Liskeard	5 17 0	17	10 2 6	0 7 6	Jan. 1854
1024	Wheel Tremayne (tin, cop.), Gwennap	2 6 1/2	5	—	—	—

FOREIGN MINES.

2464	Burra Burra (cop.), South Australia	5 0 0	116	265 0 0	5 0 0	June, 1861
12000	Cobre Copper Co. (cop.), Cuba	40 0 0	36 37	97 12 0	1 0 0	July, 1861
10000	Cortezia Mining Company, Chili	1 0 0	8	0 4 0	0 5 0	Jan. 1861
16000	East Indian Coal, Calcutta	10 0 0	10	1 1/2 per cent.	—	Yearly
70000	English and Australian	5 0 0	3 1/2	15 5 0	1 0 0	Aug. 1861
25000	Gen. Mining Assoc., Nova Scotia	130 0 0	23 24	15 5 0	1 0 0	June, 1861
60000	Kapunda Mining Co., Australia	1 0 0	2 1/2	0 8 0	0 2 0	June, 1861
15000	Linares (id.), Pozo Ancho, Spain	3 0 0	8	0 8 0	0 3 4	July, 1861
10000	Lusitania (of Portugal) (S.E.)	2 0 0	2 1/2	0 18 0	0 1 6	Aug. 1861
10816	Marquita and New Granada	1 0 0	5 1/2	0 9 6	0 1 6	July, 1859
100000	Port Phillip (gold), Clunes	1 0 0	1 1/2	0 4 0	0 1 0	July, 1861
11000	St. John del Rey (L.), Brazil	15 0 0	81 1/2	43 5 0	2 10 0	June, 1861
20000	West Canada Mining Company	1 0 0	1 1/2	0 2 0	0 2 0	June, 1860

FOREIGN MINES WITH DIVIDENDS IN ABEYANCE.

10000	Altun and Quannagen Uni. (cop.) (L. £5)	4 10 0	3	4 5 0	0 15 0	Nov. 1853
10000	Gt. Barrier Land, Min. & Co. (L. £5)	4 10 0	3 1/2	—	—	May, 1859
10000	Pontbagnat (all-lead), France	20 0 0	4	1 0 0	1 0 0	June, 1855
48174	Unit. Mexican (all-lead), Mexico	28 5 0	8 1/2	1 16 6	0 4 0	Feb. 1853

NON-DIVIDEND FOREIGN MINES.

Sharees.	Mine.	Capital.	Paid.	Last Pr.	Bus. done.	Last Call.
20000	Australian (copper), South Australia [S.E.]	7 7 6	1 1/2	3 1/2	1	Sept. 1858
75000	Bon Accord, South Australia (copper) [L. £1] [S.E.]	0 17 6	—	—	—	Dec. 1860
6000	Central American (silver) [L.]	5 0 0	12	—	—	Feb. 1859
17000	Central Italian (copper) [7000 £3 paid]	0 6 0	—	—	—	Jan. 1859
60000	Clarendon Consols (copper), Jamaica [S.E.]	0 17 6	3 1/2	—	—	Jan. 1861
10000	Copio Smelting [L.], Chili	10 0 0	8 1/2	—	—	Fully paid.
75000	Dun Mountain (copper), New Zealand [L.] [S.E.]	1 0 0	1 1/2	1 1/2	—	Fully paid.
25000	East del Rey, Brazil	1 0 0	1 1/2	1 1/2	1 1/2	Sept. 1861
20000	East Kongberg Native Silver Mining Co. of Norway [L. £5]	1 0 0	1 1/2	—	—	Sept. 1861
80000	Ellerslie and Bardowie, Jamaica	0 18 0	1 1/2	—	—	July, 1859
8000	English and Canadian Mining Company [L.]	5 0 0	—	—	—	Fully paid.
25000	Fortuna (lead), Spain [L.] [S.E.]	2 0 0	2 1/2	1 1/2	2 1/2	Fully paid.
80000	Great Northern (copper), South Australia [L. £2] [S.E.]	1 0 0	1 1/2	1 1/2	1 1/2	Fully paid.
4000	Hope Silver-lead and Copper Mining Co. [L.], Jamaica	25 0 0	—	—	—	Fully paid.
80000	Imperial Thessalian (lead, &c.), Thessaly [L. £2]	0 10 0	3 1/2	—	—	June, 1860
20000	Laguaira (sulphur), Cuba [L. £1]	6 12 6	3 1/2	—	—	Nov. 1861
80000	New Granada (gold), South America [S.E.]	1 0 0	1	—	—	Fully paid.
10000	New Grand Duchy of Baden (silver-lead), near Freiberg	1 0 0	1	—	—	Nov. 1858
60000	North Rhine Copper of South Australia [L. £1] [S.E.]	0 15 0	3 1/2	—	—	Nov. 1861
15000	Pachuca Silver Mining Company, Mexico [L. £1]	0 10 0	—	—	—	April, 1861
80000	Scottish Australian Mining Company [L. £1]	0 10 0	1	—	3 1/2	Nov. 1858
20000	South Europe Mining Company, Spain [L. £5]	3 0 0	—	—	—	May, 1860
80000	St. John's United (copper, lead), Newfoundland [L.]	1 0 0	—	3 1/2	—	Fully paid.
20000	St. Lawrence (copper), Fred. Sharps, &c. pd., 25,000	11 0 0	—	1 1/2	—	Fully paid.
1000	Western Africa Malachite (copper) [L.]	4 0 0	—	—	—	Oct. 1861
12000	Wheal Eilan, South Australia [L. £5]	4 0 0	4 1/2	—	—	July, 1860
35425	Wheal Jamaica (copper)	1 0 0	18 1/2	—	—	Fully paid.
80000	Worthing (copper), South Australia [L.] [S.E.]	1 0 0	—	3 1/2	10 1/2	Fully paid.

SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1372.—Vol. XXXI.]

LONDON, SATURDAY, DECEMBER 7, 1861.

[WITH STAMPED.... SIXPENCE.
JOURNAL] UNSTAMPED, FIVEPENCE.

NEW METALLURGICAL TEXT-BOOK.

METALLURGY: the Art of Extracting Metals from their Ores, and Adapting them to Various Purposes of Manufacture. By JOHN PERCY, M.D., F.R.S., Lecturer on Metallurgy at the Government School of Mines. London: John Murray, Albemarle-street.

The want of a treatise upon metallurgy, to which the student could refer with confidence, and which would likewise be of utility to the practical smelter, has long been acknowledged, but the work now before us, from the pen of Dr. Percy, appears in every way calculated to remove the necessity for any complaints for the future; not only has the author afforded convincing proof that he has given his readers the full advantage of his long connection with practical metallurgy, but he has also, through his intimate acquaintance with continental languages, been able to render the researches of the most celebrated French, German, and Swedish metallurgists available to them. As Dr. Percy very justly remarks, British metallurgists have contributed but little to metallurgical literature, but this should not lead to the erroneous conclusion that our smelters are too ignorant of chemistry to understand the theory of the processes under their direction, or too illiterate to be able to record the results of their experience. The chief writers on metallurgy are the Germans, and we are probably indebted to them to a much greater extent than is commonly supposed for the development of our mineral resources since the introduction, about three centuries ago, of German miners and metallurgists, through the wisdom of Elizabeth. Throughout the work the doctor evinces a strong desire to acknowledge the obligations he is under to the writers who have preceded him, and to all from whom he has received assistance, so that the work has the advantage, as well as being a valuable text-book, of forming a ready guide to the best authorities upon any given matter of detail. To allude to the utility of a work by an author enjoying such a position in the scientific world as Dr. Percy were almost superfluous, did it not so frequently happen that men best acquainted with the subject they teach are least able to commit their observations to writing in a concise and readily intelligible manner. The vast amount of information obtainable from following a course of Dr. Percy's lectures is well known, and with regard to his book more can scarcely be said in its praise than that the method of arrangement which he has adopted in the work is nearly the same as that which he has followed in his lectures, and which, so far as relates to the instruction of students, has thoroughly succeeded.

In the volume before us, Dr. Percy has treated the subjects of fuel, fire-clays, copper, zinc, and brass ably and exhaustively, reserving iron, lead, silver, gold, platinum, nickel, cobalt, arsenic, bismuth, antimony, tin, mercury, &c., for a second and concluding volume. After defining the science of metallurgy, the author arranges the metals into classes according as they are fusible below redness, as tin and lead; fusible above redness, but at temperatures easily attainable in furnaces, as copper and gold; fusible only at the highest temperatures attainable in furnaces, as nickel and manganese; and practically infusible, at least in ordinary furnaces, as platinum and iridium. Metals are either fixed or volatile by heat; the fixed metals are gold, copper, nickel, &c., and the volatile metals are, after fusion, cadmium, zinc, &c.; and without fusion, passing directly from the solid to the gaseous state, arsenic. Dr. Percy then explains that the specific gravity of metals at the ordinary temperature ranges between 0.6 and 21.5; how the crystallisation of metals is effected by slow and by rapid cooling; the varieties of fracture; as well as the malleability, ductility, tenacity, conduction, &c., of the several metals. By this means the reader is well prepared for the General Considerations of Metallurgical Processes, to which he is next introduced. The term ore is applied to the metalliferous matter in the state in which it is extracted from the earth by the miner. Metals occur in the earth either in the metallic state or in the state of chemical combination, as sulphides, oxides, and carbonates, or more rarely as arsenides, chlorides, sulphates, phosphates, and silicates. The term native is used to express their occurrence in the metallic state; thus gold and platinum occur native. Native metals are not necessarily pure; thus no instance is recorded of native gold free from silver. Ores exist in the earth either in veins or beds, and it may be convenient for the sake of brevity to designate as extraneous matter everything in the ore except the metallic mineral species which is the object of search by the miner. This extraneous matter is separated in a greater or less degree by the mechanical processes of dressing practised at the mines, and the ore may then be regarded as ready for the smelter. Metallurgical processes may be divided into dry and wet, according as they are conducted, without or with the agency of liquid reagents; in some instances a metal is extracted by a combination of dry and wet processes. The various kinds of metallurgical processes, continues Dr. Percy, may be classified as those in which the separation of the metal is without fusion of the ore, subdivided into the direct without reduction, and the indirect with reduction; and those in which the separation of the metal is with fusion of the ore subdivided into the processes involving simple fusion (simple reduction with fusion), reduction with volatilisation of the metal, and reduction by complex processes with fusion. The various processes of reduction, smelting, roasting, distillation, sublimation, and liquation, are then in turn explained. Slags, their atomic constitution, external characters, and fusibility come next under consideration, and upon this subject Dr. Percy affords a large amount of minute details, which may possibly prove serviceable to those desirous of converting the enormous quantity of slags now wasted to useful purpose. The general consideration of metallurgical processes being disposed of, Dr. Percy next proceeds to make his readers intimately acquainted with the various qualities of fuel—the chapter being at once of the greatest scientific and practical value. After a few interesting general remarks, the calorific power of fuel is treated of—Rumford's experiments, the researches of Favre and Silbermann, and Berthier's process of estimating the calorific power of fuel being fully described. The several descriptions of fuel are then classified—wood, peat, coal, charcoal, and coke, and the various kinds of each are particularised and explained, in order that the student may ascertain the relative merits and demerits of each. The nature and value of fuel being thoroughly understood, the student is well prepared for the succeeding chapter on the Natural Refractory Materials employed in the construction of crucibles, retorts, and furnaces, which completes what may be described as his preliminary instruction—his preparation to converting the metal contained in the ore into a marketable product being then complete. Fire-clays are first considered, the variation in their composition being duly noted, and analyses given of a very large number of British and foreign fire-clays. Then follows an interesting paper on crucibles, the various kinds of crucibles being described, and their relative merits explained. The Cornish crucibles of Juleff, of Redruth, and Mitchell, of

Truro, the London crucibles of Ruel, and the white fluxing-pots of the Plumbago Crucible Company being highly commended; as are Ruel's black lead crucibles. Several ingenious little crucible moulds are then described, and as crucibles would be little worth without a means of melting their contents, the doctor gives accurate mechanical drawings of Sefström's blast-furnace, which has already been referred to in the *Mining Journal* as particularly suited to laboratory purposes, and of Deville's furnaces, so useful for obtaining high temperatures.

We now arrive at the treatment of the ores themselves, copper being the first metal of which Dr. Percy treats. The history of copper, and the various conditions under which it exists in nature and in the laboratory being fully explained, the reader is given a very interesting series of historical notices on Copper Smelting in Great Britain. The manufacture of copper near Llandudno, by the Romans; the working of a rich copper mine at Keswick, in Cumberland, by the Earl of Northumberland, in the time of Elizabeth; the fact that our ancestors imported copper from Hungary and Sweden, and allowed calamine to be exported as ballast; the copper-works of Yorkshire, Staffordshire, and Lancashire, at Bristol, and in the earlier period of copper smelting in Cornwall, are each referred to, and the entire chapter rendered thoroughly acceptable both to the technical and general reader. Dr. Percy extracts a morsel from De Dunstanville's edition of Carew's "Survey of Cornwall," written about 1739, which cannot be passed over without notice. Even at that time the smelters' earnest desire to defraud the miner is commented upon; and as a similar view is expressed by more recent writers—indeed, by the majority of those who are supposed to be writing in the interest of the miners, it would almost seem that the minds of Cornishmen have become so impregnated with the idea that everyone is desirous of cheating them, that they are unable to discern whether or not they have cause of complaint. In referring to the establishment, in 1754, of copper-works at Enniscorthy, Price remarks that "the (copper) companies left no method unsought to traduce the credit and stab the vitals of this undertaking;" yet, as Dr. Percy remarks, "as the adventurers felt themselves so much aggrieved by the smelters, they might have entered into a combination to keep up the price of ore." The fact is, the miners are paid fairly for their ore, and that the smelters do not receive a larger profit than they are entitled to, considering the immense capital at stake, and the ordinary risks of business, and we opine that no benefit could result to the miners from attempts to smelt their own ore. Dr. Percy carefully describes the treatment of the ore from the time it leaves the mine until it is ready for the smelter, and continues it through the various smelting processes, until it reaches the marketable condition. The most approved forms of furnaces are described and illustrated by drawings which would be ample for the purposes of the furnace builder. The description of the smelting processes has not, we think, upon any previous occasion been so minutely and accurately given as by Dr. Percy. Not only is the Welsh process described, but also the various other processes in use, amongst them the system of smelting in blast-furnaces, the kern roasting at Agordo, &c., the consideration of the treatment of copper being concluded by ample details concerning the assaying of copper ores by the Cornish method.

The history of zinc is given in a very concise and readable form, yet contains a vast amount of information. Though giving all credit to Basil Valentine, Paracelsus, and Albertus Magnus, the author remarks that from the following passage, which occurs in Strabo, one might at first almost be disposed to conjecture that zinc, in its metallic state, was not unknown to the ancients:—"There is a stone near Andeira which, being burnt, becomes iron; afterwards, when melted in a furnace with a certain earth, it drops false-silver, which, with the addition of copper, produces what is called the mixture, and which some name orichalcum. False-silver is also found in the neighbourhood of Tenolus." He refers to the arguments for and against the assumption that this false-silver was zinc, but offers no opinion on the subject; for ourselves, we should incline to the opinion that it was zinc, though whether produced from the stone found at Andeira or the "certain earth," it seems impossible to form an opinion. Calamine was formerly pretty abundant in England; it is stated that, in about the middle of the 17th century calamine brass-works were erected in Surrey by Demetrius, a German, at an outlay of 6000*l.*, and that a good profit was realised. But British and foreign merchants combined against the proprietor, and involved him in lawsuits; and meeting with no encouragement, he was at last ruined, and was compelled to abandon the works, "to the unspeakable prejudice of the kingdom." Calamine brass-works were established in Bristol about 1702, and afterwards at Cheadle, in Staffordshire, about 1720. It must not, however, be supposed, from our selecting these interesting little extracts from Dr. Percy's work, that he has sacrificed utility to make a readable book; these historical sketches are merely given as an introduction to the technical portions of the chapters on the several metals, and the reading of them can but increase the student's interest in the subject, and cause him to pursue his studies with greater zest. Dr. Percy minutely describes the physical and chemical properties of zinc, as well as the various classes of ore from which it is obtained. The English process of extracting zinc is given at some length; then the Silesian, Belgian, and Cornish processes are explained; after which the various methods of extracting zinc are compared with each other, and the alleged improvements in the extraction of zinc are carefully considered; the treatise being closed by an elaborate exposition of the methods of assaying the ores of zinc.

In treating of brass, Dr. Percy confines himself to the alloys of copper and zinc, but it should, he remarks, be more properly confined to such as are either decidedly yellow or have the yellowish tint characteristic of brass. In a subsequent part of the work, he will examine the subject of the constitution of alloys, so that the study may be rendered more agreeable. After explaining the value, malleability, crystals, process of stamping, &c., of brass, he describes the qualities of various alloys of copper and zinc. The preparation of brass is next treated of, the mode of manufacturing calamine brass being first considered, and then the process of direct preparation by adding metallic zinc when the copper has been just melted in the crucible or reverberatory furnace. A few miscellaneous observations on brass, showing how brass especially suited for any particular purpose may be obtained, and explaining the modes of annealing, lacquering, &c., brings the volume to a close. Regarding the work in its entirety, we have no hesitation in stating that as a Text-Book on Metallurgy Dr. Percy's treatise, so far as regards the metals treated of, is unsurpassed by any which we have seen in English, French, or German, and that it is particularly adapted to the requirements both of the student and the practical smelter. It is arranged upon that admirable system which first affords the reader a general view of the subject he is about to study, and then leads him to the minutest details—a system which we are convinced is the only one that can be confidently relied upon by those really desirous of acquiring knowledge themselves, or of imparting it to others.

HISTORY OF CIVIL ENGINEERING.

LIVES OF THE ENGINEERS: with an Account of their Principal Works: comprising also a History of Inland Communication in Britain. By SAMUEL SMILES. London: John Murray, Albemarle-street.

To be enabled to produce a book which has at once the conciseness necessary to render it valuable to the professional man, and the interesting character which makes it acceptable to the general reader, requires a power not very generally possessed by authors, yet one which, when possessed and exercised, is sure to be appreciated. In his "Lives of the Engineers" Mr. Smiles has displayed all the abilities of a good popular writer, without, however, rambling into those paths which render a popular book worthless as a work of reference. The information is clear and concise, yet it is so interspersed with anecdotes, poetical scraps, and interesting notes, not to mention the innumerable and admirably executed engravings of some of the greatest architectural beauties and curiosities in the kingdom, that the work will undoubtedly be read with pleasure by every member of the community within whose reach it comes. In volumes such as those of Mr. Smiles's, it is difficult to select examples wherewith to give an idea of the precise nature of the book; for whether we look at the historical, the biographical, or the technical portions of the work, we find much that is worthy of especial notice. Nor are we much more successful when we attempt to confine ourselves to the matter strictly connected with mining pursuits, for we have the history of Sir Hugh Myddelton's connection with the mines of Cardiganshire; the history of Brindley's connection with collieries; the history of Sir Francis Drake's great enterprise for supplying Plymouth with water; an interesting account of the antiquities of Dartmoor; an account of the first wade bridge over the Camel, and numerous other really excellent treatises.

Passing over the pedigree of Hugh Myddelton, we find that he commenced life as an apprentice of the guild of the Goldsmiths' Company. His great work—the New River, for supplying London with pure water, was his first enterprise in connection with engineering, and his next was the embarkment of Brading Haven; but his parliamentary connection with his native town of Denbigh afterwards made him acquainted with the mining enterprise then on foot in different parts of Wales, so rich in ores of copper, lead, and iron. It appears that the Governor and Company of Mines Royal in Cardiganshire were incorporated in 1604, for the purpose of working the lead and silver mines of that county. The principal were those at Cwmsymlog and the Darren Hills, situated about midway between Aberystwith and the estuary at the mouth of the River Dovey; they were at Skibery Coed. For many years these mines were worked by the Mines Royal Company with little success. Although there was plenty of ore, the mines were so drowned with water that the metal could not well be got at and worked out. Here Myddelton's engineering skill was again displayed. The Mines Royal Company, too glad to get rid of their unprofitable undertaking, agreed to farm it to Sir Hugh for 400*l.* per annum. It took him some time to clear the mines of water, which he did by pumping machines of his own contrivance; but at length sufficient ore was raised to enable it to be tested, and it was then found to contain a considerable proportion of silver. His operations seem to have been attended with success, for he shortly found him sending considerable quantities of silver to the Royal Mint to be coined. King James was so much gratified by Myddelton's skill and enterprise that he raised him to the dignity of a baronet, and, as a further compliment, directed that he should be discharged from all customary fees, amounting to 1095*l.*; and amongst the reasons and considerations for the grant of the dignity we find that one is "For finding out with a fortunate and prosperous skill, exceeding industry, and no small charge in the county of Cardigan a royal and rich mine, from which he hath extracted many silver plates, which have been coined in the Tower of London for current money of England." Beyond this, the king waived all claim to royalty on the silver raised by Myddelton, though the lessee who succeeded Sir Hugh paid royalty into the State Exchequer. As an entire chapter is devoted to Myddelton's Mining Enterprise in Wales, we must let this brief abstract, showing the character of the information, suffice, remarking, however, that the chapter contains a vast amount of information, and is rendered more interesting by being illustrated by rare engravings of the early mining works in Wales. Several reports which have been circulated with reference to Myddelton are shown by Mr. Smiles to be without foundation, not the least important contradiction being that with reference to the manner in which the funds were obtained for making the New River. The common story, says Mr. Smiles, told of Myddelton's subsequent execution of the New River is that he was enabled to carry out the works by means of the large fortune he had realised by the working of a "silver mine in Wales." This has been repeated by every writer on the subject of Sir Hugh Myddelton's career, from Stowe downwards; but it is altogether without foundation, the only mining adventure on which he entered previous to the New River enterprise being that at Denbigh, which proved a total failure.

Before Sir Hugh Myddelton had commenced his great work of supplying London with water, a similar blessing had been conferred upon Plymouth by the construction of the "leat." Sir Francis Drake, who was born within ten miles of Plymouth, and settled in the neighbourhood of the town, after having realised a considerable fortune by his adventures on the Spanish Main, observing the great inconvenience from the want of water (clothes were sent more than a mile to be washed, and the water for domestic purposes was fetched from Plympton, five miles distance), as well as the difficulty of furnishing the ships frequenting the port with that indispensable necessity, conceived the project of supplying the deficiency by leading a store of water to the town from one of the numerous springs on Dartmoor. In 1587, when he represented Bossiney (Tintagel), in Cornwall, he obtained an Act enabling him to convey a stream from the River Mew, or Meavy, and in the preamble to the Act it was expressed that its object was not only to ensure a continual supply of water to the inhabitants, but to obviate the inconvenience hitherto sustained by seamen in watering their vessels. It appears that the town of Plymouth contributed 200*l.* towards the expenses of the works, Sir Francis being at the remainder of the cost. The leat was finished in four years, and the welcoming of the stream into the town was attended with great public rejoicing.

The mention of Dartmoor leads us to refer to Mr. Smiles's essay on Bridges, Harbours, and Ferries, for which he has a frontispiece very appropriate—the ancient British bridge on Dartmoor. In earlier times no inconsiderable inconvenience was felt in having to cross streams by fording or swimming; afterwards an uprooted tree, or a couple fixed together, afforded ample accommodation, though inconvenience may have resulted from the entire structure being usually swept away with the heavy rains of autumn, and

hence, says Mr. Smiles arose the idea of tying the rocky gorges together by means of stone bridges of a more solid and permanent character. The first of such bridges in Britain were probably erected across the streams of Dartmoor. The rivers of that district are rapid and turbulent in winter, and come sweeping down from the hills with great fury. The deep gorges worn by them in the rocks amidst which they run prevented their being forded in the usual way, and the ordinary expedient of bridging the gaps in the track by means of felled trees thrown across was found impracticable in a district where no trees grew. But there was an abundance of granite blocks, which not only afforded the means of forming solid piers, but were also of sufficient size to be laid in a tabular form from one pier to another, so as to constitute a solid enough road for horsemen and foot passengers: hence the Egyptian-looking Cyclopean bridges of Dartmoor—a series of structures most probably coeval with the building of Stonehenge, and of the greatest possible interest. One of the largest of these bridges is that crossing the East Dart, near Post Bridge, on the road between Moreton and Tavistock, which is the bridge chosen by Mr. Smiles for his illustration. Though the structure is rude, it is yet of a most durable character, otherwise it could not have withstood the fury of the Dart for full twenty centuries, as it probably has done. The bridge is of three piers, each consisting of six layers of granite slabs above the foundation. One of the side piers, by accident or design, has unfortunately been displaced, and the tabular slabs originally placed upon it now lie on the bottom of the river. Each of the table stones is about 15 feet long and 6 feet wide, and the whole structure is held together merely by the weight of the blocks. There are other more perfect specimens on Dartmoor, but none of equal size. It is believed that no structures resembling these bridges have been found in any other part of Britain, or even in Brittany, so celebrated for its aboriginal remains. The only bridges at all approaching them in character are found in Ancient Egypt, to which, indeed, they bear a striking resemblance.

Old Bow Bridge, demolished some twenty years since, and the celebrated bridge at Burton-on-Trent, erected by Abbot Bernard, are carefully described; but we pass these interesting descriptions, to refer to Wade Bridge, with which many of our readers are familiar. "The erection of Wade Bridge," says Mr. Smiles, "over the River Camel, in Cornwall, is an example of the origin of many of these structures in early times. The benevolent Vicar of Eglshayle, lamenting the number of lives that were annually lost in crossing the ferry, determined to raise a fund sufficient to build a bridge, and success crowned his efforts. It was erected in 1485, and claimed the distinction with Burton of being the longest in England. It consisted of seventeen arches, and was a highly picturesque object, though it has since been replaced by a more convenient structure." Returning to Wales, we find a beautiful engraving of Edwards's bridge, the Pont-y-Prydd, and we may commend the memoir of Edwards to general perusal. After the life of Edwards, we come that of James Brindley, the wheelwright's apprentice, who wrought such changes in commercial affairs on the western coasts of our island, by constructing canals under the patronage of the Duke of Bridgewater. The Duke's canal, when opened out to Liverpool, immediately conferred upon Manchester the immense advantage of direct connection with an excellent seaport; and other canals being connected with the Duke's system, the whole industry of the surrounding districts was brought, as it were, to the very doors of Manchester. But Liverpool was not less benefited by the Duke's enterprise. Previously, the woollens and cottons exported were sent by pack horses to Bristol or Bridgnorth and the Severn, but the canals caused the concentration of the whole export trade at Liverpool. The additional accommodation required for the increased business of the port was promptly provided as occasion required.

New harbours and docks were built, and before many years had passed Liverpool had shot far ahead of Bristol, and became the chief port on the west coast, if not in all England. Had Bristol been blessed with a Duke of Bridgewater, the result might have been altogether different; and the valleys of Wilts, the coal and iron fields of Wales, and the estuary of the Severn, might have been what South Lancashire and the Mersey are now. In his second volume, Mr. Smiles gives us the lives of John Smeaton, John Rennie, and Thomas Telford; and the information obtainable from this portion of the work is certainly not less interesting than that we have already referred to. In connection with the life of Smeaton, we have the highly interesting history of the Eddystone, and the several futile attempts which preceded the lighthouse of Ruydyer, and the still more substantial structure of Smeaton. "The narrative is admirably given; the reference to the joy-inspiring words 'Eddystone light ahoy' reviving the thrill which can only be felt by those who know the pleasure of nearing the termination of a tedious voyage. With regard to Rennie, we have the history of his famous lighthouse on the Inchcape rock, for which Mr. Robert Stevenson, his assistant engineer, arrogated to himself by far too much credit; whilst in London Rennie has left a lasting monument of his own rearing—the beautiful iron structure, Southwark-bridge. The life of Telford is no less attractive, as it introduces us to some of the most elegant and substantial aqueducts in the kingdom. The Ellesmere Canal consists of a series of navigations proceeding from the River Dee, in the Vale of Llangollen. One branch passes northward by Chirk, Ellesmere, Whitchurch, Nantwich, and Chester, to Ellesmere Port, on the Mersey; another in a south-westerly direction, through the middle of Shropshire; and a third in a south-westerly direction, by Oswestry to the Montgomeryshire Canal, near Llanymynech, its whole extent, including the Chester Canal incorporated with it, being about 112 miles. On this canal Chirk aqueduct is a splendid piece of workmanship, yet almost sinks into nothingness when compared with that at Pont-Crysltan, which Sir Walter Scott certainly justly described in speaking of it to Southey as "the most impressive work of art he had ever seen." The level of the water in the former is 65 ft. above the meadow, and 70 ft. above the level of the River Ceri beneath; the latter is 127 ft. above the lowest part of the valley it spans. We must leave our readers to refer to the volume for the remaining engineering works of Telford, and for the illustration of his very bold design of forming a bridge of a single span over the Thames, as well as for the descriptions of the many lasting and beautiful works erected under his superintendence. The entire work is embellished with engravings of the best finish, the execution of which cost, it is said, nearly 1500*l.*; and as tinted plate-paper has been used throughout, the artistic skill is displayed to the best advantage; indeed, whether we consider the work for its contents, or the way in which it has been issued from the press, we can form but one opinion—that it is, as near as may be, perfect.

IMPROVED PROSPECTS OF ENGLISH INVESTMENTS ON THE CONTINENT.—The recent declaration by the Emperor of the French, that he will be content to maintain his army and navy on a peace footing, has induced investors to look with greater interest on the many opportunities which are constantly being presented from the Continent. Doubtless this increase of confidence in the solidity of political affairs will largely increase the flow of capital in that direction, and cause many dormant speculations to be revived—manufacturing as well as mining and railway construction. Thus we have seen the Paris Land Company well supported and floated by English capital, and also the coal mines in Prussian Germany. In connection with the new and improved prospects of investors in continental projects, our attention has been called to an extensive manufacturing project, which has been taken up by English capitalists, as the Anglo-French Porcelain Company, and of which we think a short account will be interesting to our readers. The porcelain manufactures are replete with interest, as involving the lowest form of art, in the production of "earthen vessels" of the meanest utility, to the most tasteful forms of ornament which art can devise and embellish; and there is an amount of capital employed in their production and sale which few have an adequate conception of. Suffice it to say that our pottery manufacturing districts are amongst those which rank high in the scale of our national industries. The following particulars of this undertaking we gather from the prospectus of the company.—It was projected and introduced to public notice immediately after cementing the alliance between England and France on the conclusion of the Russian war with the western powers. It was registered under the Limited Liability Companies Act, 1856-7. The nominal capital is 64,000*l.*, in 3200 shares of 20*l.* each: 2000 of these shares were taken by the proprietor of the manufactory purchased as an earnest of his faith in the goodness of the undertaking. He took no money payment whatever, and in consideration for these shares he transferred the whole property and good will of the business to the company. As a further proof of his confidence in the profitable character of the business, he allowed all the other shares, intended for the public, to bear a preferential dividend of 12 per cent. per annum out of the profits. The company has heretofore been composed of private gentlemen, who are mutually known to each other, and a few of their respective acquaintances, who had taken up only a portion of the shares authorised to be issued for the additional capital required to carry the business with the great accession of business which the celebrity of the manufactory has attracted to it. The recent introduction of the new Commercial Treaty between this country and France justifies the expectation of a greatly increased accession of business to this establishment; and the directors, therefore, have resolved on offering the public an opportunity of taking a portion of the reserved shares, which bear 12 per cent. preferential dividend per annum. The London office is at No. 35A, Moorgate-street, where specimens of its manufacture are on view. The business is carried on at the manufactory, at St. Gaudens, under the joint control of the late proprietor and an English gentleman, who takes the management of the financial department of the establishment, in which both reside, for the purpose of keeping up a constant supervision of its business. They are responsible to the board of directors, whose office is in London. The property of the company comprises—The very extensive porcelain manufactory known as the Valentine Manufactory, situated near the town of St. Gaudens, in the Department of the Haute

Garonne, in France, where the business of the company is carried on. The manufactory has been established thirty years, during which period its productions have obtained a great celebrity, and twenty-two gold, silver, and bronze medals have been gained, amongst which are those awarded at the Exhibition in Hyde-park, in 1851, and the Paris Exhibition in 1855. The articles manufactured embrace white, painted, and printed earthenware; English china and porcelain wares, by both the lithographic and copierplate processes; yellow crockery, stoneware, bricks and fire-proof crucibles. The extent of the establishment is about 8 acres, all freehold. There are five monster ovens, four drying-rooms, twenty-four workshops, a dwelling house for the manager of large size, and very numerous offices and apartments. The mechanism, with the most recent improvements, is such that a sack of clay, or a block of chalk, brought upon the premises in their natural state, are converted in a very short time into articles of the most decorative elegance—blancs for statuettes and objects of *verre*; stoneware, and imitation marble, architectural ornaments, &c. The manufactory is now in full activity, and very favourable results are being obtained by the improved system of working recently adopted by the managers. The company has recently received a considerable accession of share capital, through English investors, entirely subscribed by private parties, who have the greatest reliance on the success of the company, whose business has been long and securely established. The company's property has recently been surveyed by a deputation from the English shareholders, and a report of the French Government has pronounced the freehold worth 15,000*l.* free simple. The good prospects of the company's trade are greatly increased by the new free trade regulations between England and France; and, indeed, are such as to warrant the company's anticipations of greatly increased profits, especially as soon as its operations are extended, for which funds have been fully provided by the additional shares which have been taken up by the English capitalists just referred to. The Emperor's recent determination to reduce his expenses to that of a peace establishment has given greatly increased confidence to all capitalists who are desirous of reaping the high returns for capital which can be made by investing in any of the numerous manufacturing and mining industries of France, whose present great want is a plentiful supply of the great agent of trade—money, and which is now so plentiful with us as to have but a very low percentage offered to its holders by our great trading and manufacturing interests. In thus calling attention to these English projects of employing capital in foreign countries for manufacturing purposes, we in no way wish to be understood as recommending them to our readers in preference to home undertakings, but as matters to be taken into consideration by those looking out for opportunities of securing large returns on their capital; and we shall, therefore, from time to time note all the more remarkable undertakings of this class which have been or may be introduced for the consideration of investors.

REMARKABLE MINERAL DEPOSIT.

At the Miners' Association of Cornwall and Devon meeting, the first paper was on a mineral deposit in Devon, and was read by its author, Mr. John Simmons, mineral agent of the Duchy of Cornwall. The paper was illustrated by a plan or section, showing that the deposits referred to were situated at one side of an old quarry, and by a number of very interesting specimens brought from the old workings. My principal object in furnishing this paper is with a view of cultivating among the members of the classes of this association a feeling for a mutual interchange of ideas and opinions on any subject that may tend to promote mining, and for the benefit of mining generally, observations particularly on mineral deposits, or mineral stains, in whatever locality they may be met with. Mining operations are carried on to such an extent at the present day in so many localities in both counties, and in various parts of the known world, as to afford every facility for practical observation to the enquiring mind; and if such facts and observations were carefully arranged and made known, they would be found highly interesting and instructive to those who may not have the advantage of equal range for such observation and researches, and, no doubt, it would tend to the welfare of mining in all its branches. The few humble observations which I have to make are respecting a mineral deposit in a mine in Devon, called Wheal Hamlyn. The mine is situated in the parish of Bristowton, on the north side of the road leading from Tavistock to Okehampton, and is within about a mile north of the granite range of Dartmoor. The country principally is slaty, with patches of limestone, and a considerable quantity of black shale having the appearance of lignite, but is without any trace of organic remains, so far as I could perceive. The darkest of these layers (which he pointed out on the diagram) vary from 6 in. to 1 ft. in thickness; they are composed of soft decomposed matter, containing black carbonaceous matter, and by thrusting any iron substance into these seams it immediately becomes coated with metallic copper. The lighter coloured seams are harder, being of a slaty nature, and contain native copper and allophane, stained more or less with carbonate of copper in various places between the joints or heads. The whole mass is a peculiar formation of apparently numerous layers, tilted up to a ridge, plainly showing the existence of its anticlinal axis and disturbance, probably the result of some great acting force; and it was from the fact of copper stains exuding from the numerous seams that mining operations were commenced on it by a Cornish captain, who raised a quantity of the stuff, and on having a sample assayed from the whole bulk found it would produce about 2½ per cent. for copper, but as this percentage was not equal to pay for the cost of the stuff, he was obliged to leave it, and he commenced dressing and washing it by hand, hoping that by leaching the bulk he might improve the quality, and from the great quantity which could be raised he was confident that he should realize a good profit, but by the application of water the copper was easily brought into solution, and evidently carried away with the water in process of dressing, as on sampling the prepared ore it was found to be entirely valueless—consequently the works were abandoned, to the very great disappointment of the sanguine captain. After lying idle for a considerable time, it was taken up by another party, who drove a level from the foot of the quarry, where the copper stains appeared the strongest. In driving this level, it was most remarkable that in cutting the dark copper-bearing layers a greenish gas was evolved, and a small quantity of copper was given off in such quantities as sometimes to extinguish a lighted candle. The men were obliged repeatedly to cease working until the gas had been liberated from the seam through the opening which had been made. This occurrence was frequently observed during the driving, until a shaft was put down, and ventilation effected, when the level was driven a few fathoms further in the hill, and a fine looking lode, 6 ft. wide, discovered, composed of iron pyrites and copper ore, but there not being sufficient copper in it when pierced through to pay for working, with its long carriage, without opening either way on this promising lode, the mine was again abandoned, and is still idle to this day. On visiting the mine on a recent journey to that locality, I was greatly struck, when entering the level, with its most remarkable appearance. It was dry sulphate of copper, associated with allophane (such as I present to you), was seen, their beautiful greenish blue and white colours greatly contrasting with the deep black matrix in which they are found. Native copper is also to be seen in the carbonaceous veins, of a peculiar granular texture, such as the specimens on the table before you. 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wheel. In motion the wheel "is changeable from a square to a rhomboid . . . and in order for this machine to act as a wheel, each end of the joints have a small wheel behind them, which press upward on a sort of chondoid curve, which guides the motion, so as to enable the carriage to travel in a right line, parallel with the road." The chondoid curve and wheels, says the inventor, "must be true to a hair," and he goes on to explain how truth is in this respect to be arrived at. He also describes several modifications of the idea.

PROSPER UNITED MINES.

It must be satisfactory to the promoters of the company for working these mines to see the favourable progress made since the commencement of operations, and considering that it is not yet eighteen months since the company was formed, and less still since the first earth was broken at surface. There are, no doubt, a few whom the general, severe, and long depression in mining, as well as in other departments of business, has made to feel the inconvenience of the necessary calls that have been made; but it was stated from the first that a large amount would be wanted for machinery, &c., and all that amount has not yet been called up. At the meeting in July this estimate was increased to 25,000*l.* (of which 18,000*l.* is called), mainly on the ground that now, instead of second-hand machinery had been erected, and that the pumping-engines are more powerful than were at first intended. For mines like these it is very important that the machinery should be new and powerful, as breakages are expensive casualties, and it is far better to have too much than too little power. Now, we could name a number of mines which are dealt in in the market, and which have been constantly and strongly supported and recommended, which have been dragging on for a number of years, and upon which have been expended sums respectively much larger than is ever likely to be required for Prosper United; their position and prospects bearing no comparison with the latter, which is likely to sell more ore in the first twelve months after it is in proper working order than many of the mines alluded to have done since their commencement. Indeed, from what we have learnt in several quarters, we believe that jealousy and personal feeling have chiefly actuated certain attempts that have been made to prejudice the undertaking by parties whose self-interest would be to mind their own business, who, no doubt, are aware of this, from the particular course they have adopted to effect their object. It is really a pity that so much of this personal animosity should exist among mining men; it being too generally the practice to condemn indiscriminately everything but that which they are connected with.

We will now briefly draw attention to the representations made in the original prospectus. The mines are those known as Wheal Prosper, West Prosper, East Rodney, and Trevarthian Downs, forming a run of about 1000 fms. on the course of the lodes, by about 700 fms. wide. Large returns and profits (sometimes exceeding 2000*l.* for two months) were made from Wheal Prosper, even under adverse circumstances, and after the affairs of the then company got into Chancery. For the last six years that the mine was at work the standard averaged only 105*l.*, and at the time of the stoppage (at the French revolution in 1845) it was only 90*l.*, while the price of tin was only 25*l.* to 40*l.* per ton. The mine returned as much as 400 to 500 tons of copper ore, and 10 to 20 tons of tin, per month; and the same quantities would now realise considerably larger sums than they did then, the standard averaging now about 130*l.*, and the price of tin ore being about 75*l.* per ton. The means of dressing the tin were then very limited (having then only a few water-stamps), and the price obtained was only about 36*l.* per ton. Steam-stamps are now being erected, which will enable larger quantities to be returned, and which will realise about double the price per ton they did when the mine was at work last. Wheal Prosper and West Prosper were then worked by two distinct companies; the latter with inadequate machinery, and the former could not drive further than that direction without assisting to drain West Prosper. These causes were serious obstacles to the development of the mines, which cannot now exist. Being united under one company, they are considered to be one of the very best and safest speculations of any kind, and that they will in a short time yield large profits. Capt. T. Richards, who was the former (and is again) manager, stated in his report that as soon as the water is drained, and the mine in working order, 200 to 300 tons of copper ore, and 8 to 10 tons of tin, will be returned monthly, and this will probably be much increased as the ground is opened. In the last month the mine was at work 290 tons of copper ore were returned. The quality of the ore is good.

Capt. Wm. Martin (late managing agent of Trevarthian Mine, and who frequently inspected Wheal Prosper when it was at work) says: "I am fully persuaded, by my own calculations, that from 300 to 400 tons of copper ore per month, the first twelve months after the mine are brought into effectual course of working, can be obtained, besides 10 to 12 tons of tin ore per month. This quantity is not excessive, taking into consideration the great extent and size of the lodes, and their prosperous appearances. Hosking's and Moor lodes are from 6 to 12 ft. wide, and these of themselves will doubtless yield immense quantities of ore." "The great unexplored mass of high ground between the two mines, 150 fms. long, on all the lodes, and passing through the elvan courses, presents such unexceptionable chances of success that it removes every doubt from my mind of its being a very prosperous undertaking, and if judiciously managed, will yield immense profits. In the course of my mining career I have discovered several good mines, and realised greater profits than any other person has done in this county, but in none of them did I find better prospects than can be found in Prosper United Mines." He considers it can be made a "first-rate paying mine."

Capt. Johns (who was one of the underground agents) states that the 30 fm. level west at Wheal Prosper was the deepest driven in that direction, and that a large quantity of tin and copper was raised from it, the end being left off rich, "which (he remarks) may appear strange, but at that time there was no idea of the mine being stopped; but the driving of this level was suspended in consequence of the two elvan courses which traverse this set crossing each other near the boundary, and which extending to the West Prosper set adjoining, and from which mine the water would be drained by intersecting them." West Prosper was sunk to the 40 fm. level from surface, but the engine not being of sufficient power to keep the water, the adventurers could not prosecute the mine to advantage. I have not the least doubt that both east and west of the intersection of the elvans there are large deposits of tin and copper ore; in fact, as far as the lodes have been driven on in both the mines this has been proved; and there is still a piece of unwrought ground between the workings of the two for 180 fms. in length, which will doubtless turn out an immense quantity of mineral. Now that both mines are granted to the same party it will make a great, lasting, and very profitable concern. I do not know of another extent of ground thus containing so many large and highly mineralised lodes, and which are so favourably situated with regard to elvans and cross-courses. Our last sampling of copper ore was 290 tons for the month; the quality of the ore is very good. Had West Prosper Mine belonged to Wheal Prosper adventurers, there is no doubt but the run of mines would be working at the present time, and for years hence. The shafts are all firm and solid, and the levels are all in good working order, which is a great consideration." It may be stated that the dues are at the low rate of 1-24th.

Since the operations were begun, in July, 1860, two new 70-in. pumping-engines have been erected and set to work; and two others for crushing and hauling have been erected, one of which is at work, and the other nearly so, while the stamping engine is being erected. The shaft at West Prosper (called Louisa's) has been drained to the bottom (the 40 fm. level); and Hosking's shaft, at Wheal Prosper, is the same to the 30, and will soon be to the 40, while the 60 is the deepest level. Both these shafts have been enlarged and made good to the 30. As soon as the water was out of the shallow levels a number of tribute pitches were set, and we believe that at least fifteen are now being worked, and they are daily increasing, there being a large quantity of ore ground left which will pay. They have only lately begun to drive the 30, west of footway shaft, and already they have got a fine lode, 4½ ft. wide, composed of superior gossan, black, grey, yellow, and carbonate of copper, yielding 8 tons per fathom, and likely to improve. The vein sinking below the 30, on the tin lode, has been holed to the 40, and the end is being driven, worth 40*l.* per fathom, which is likely to continue a long distance, judging from the character of the lode. There is also a good lode for tin in the 30 end, west of Caroline's shaft. On the whole, the mine is opening, we may even say, better than was anticipated, looking at the stage yet arrived at in the operations, and in six months the returns will likely show that these mines are destined to hold a position for productiveness and profits scarcely, if at all, inferior to any in Cornwall. The course of ore in the 30 west is exceedingly good, and has every appearance of lasting. If it continues, of which little doubt is entertained, it is said that it is the best discovery made in Cornwall for a very long time. It has made a great deal of difference in the value of the tin part of the mine, which produces an immense value in copper value in copper above the elvans, the same as this lode is now situated. The tin part continues to look remarkably well. All this is much better than could have been expected, from the very little that could be done underground yet.

MINING IN CUMBERLAND.—The ancient copper and lead mines of Cumberland, in the neighbourhood of Keswick, have, as is evident from the close rolls of the reign of Henry III., been known for more than six centuries. Edward IV. granted a charter for working these mines; and in the beginning of the reign of Elizabeth a copper-works was erected, the most famous at that time in England. The Rev. Thomas Robinson, of Cusby, whose "History of Westmoreland and Cumberland" was published upwards of a century and a half ago, and is now very scarce, referring to the copper mines in question, says:—"The operators, managers, and miners were most of them Germans. The chief steward of the work was one Heckstater, who, by his book of accounts, which are most regular and exact, and all on Imperial paper, as well as by other writings I found under his hand, appears to have been a man of great learning, as well as judgment in minerals and metals. The copper ore which kept these large furnaces at constant work was, for the most part, got in the veins upon Newland Mountains. Some small quantities of ore were got upon Gaidbeck and Cunningham Mountains, and brought to the great work at Keswick, being a place most convenient both for water and coal, which they had from Bolton Colliery. In our survey of the mountains of Newland we found eleven veins opened and wrought by the Germans, all distinguished by such names given them as Gold-Scalp, Long Work, St. Thomas Work, &c., of all which veins the richest was that called Gold-Scalp. We found the vein wrought 3½ fms. wide, and 20 fms. deep above the grand level, which is driven in a hard rock 100 fms., and only with pick-axe, hammers, and wedges, the use of blasting with gunpowder being not then discovered. For securing of this rich vein no cost of the best oak wood was spared; and for the recovering of the sole under level was placed a water-gin, and water was brought to it in troughs of wood upon the top and sides of high mountains, near half a mile from the vein, the one at the top of the vein, which appeared by daylight, was sulphurous, but in sinking deeper the vein got more moisture, and the ore improved in goodness. The ore got by gin under level was so rich in silver that Queen Elizabeth used for it and recovered it from Earl Percy (lord of the manor) for a royal vein. Most of the most judicious chemists of England were concerned in the trial, either as of the jury or evidence. The verdict was given for the queen; and, as the German books give account, a hundred tons of ore was entered upon by the queen's agents." 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WEST END OFFICES.—14, BLOOMSBURY STREET, LONDON, W.C.

DODDS' IRON AND STEEL PATENT LICENSING COMPANY (LIMITED).

This company is PREPARED TO GRANT LICENSES on moderate terms for the USE OF THEIR PATENT FOR STEELING RAILS, POINTS, CROSSINGS, MACHINERY, AND EVERY DESCRIPTION OF IRONWORK.

The process, which is exceedingly reasonable in cost, and gives the most extraordinary durability to the material, has been highly approved of by the following gentlemen, firms, and companies, several of whom have extensively adopted the valuable improvement:—

ROBERT STEPHENSON, Esq.
JOHN BOURNE, Esq.
J. PERRING, Esq.
THOS. E. HARRISON, Esq.
THE GREAT INDIAN PENINSULA RAILWAY COMPANY.
THE NORTH-EASTERN RAILWAY COMPANY.
MESSRS. STEPHENSON AND CO.
THE EAST LANCASHIRE RAILWAY COMPANY.
THE GREAT NORTHERN RAILWAY COMPANY.
THE MIDLAND RAILWAY COMPANY.
THE METROPOLITAN RAILWAY COMPANY have ordered a large quantity of rails by this process.

The FOLLOWING FIRMS are PREPARED TO EXECUTE ORDERS under the company's patent:—

MESSRS. S. BEALE AND CO., PARK GATE, ROTHERHAM.
MESSRS. DODDS AND SON, ROTHERHAM.
MESSRS. LOSH, WILSON, AND BELL, NEWCASTLE-ON-TYNE.
THE EBBW VALE COMPANY, SOUTH WALES.
MESSRS. LEVICK AND SIMPSON, NEWPORT, MONMOUTHSHIRE.
MESSRS. LLOYD, FOSTERS, AND CO., WEDNESBURY.
THE ISCA FOUNDRY COMPANY, NEWPORT, MONMOUTHSHIRE.

Applications for Licenses can be made to R. COOK, Esq., at the company's offices, No. 7, Sise-lane, London, E.C., where also testimonials and other information may be obtained.

BASTIER'S PATENT CHAIN PUMP,
APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, &c.

J. V. BASTIER begs to call the attention of proprietors of mines, engineers, architects, farmers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine, as daily demonstrated by use:—

1.—It utilizes from 80 to 92 per cent. of the motive power.
2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.
3.—It occupies a very small space.
4.—It raises water from any depth with the same facility and economy.
5.—It raises with the water, and without the slightest injury to the apparatus sand mud, wood, stone, and every object of a smaller diameter than its tube.
6.—It is easily removed, and requires no cleaning or attention.

A mining pump can be seen daily at work, at Wheel Concord Mine, South Sydneyham, Devon, near Tavistock; and a shipping pump at Woodside Graving Dock Company (Limited), Birkenhead, near Liverpool.

J. V. BASTIER, sole manufacturer, will CONTRACT TO ERECT HIS PATENT PUMP AT HIS OWN EXPENSE, and will GUARANTEE IT FOR ONE YEAR, or will GRANT LICENSES to manufacturers, mining proprietors and others, for the USE OF HIS INVENTION.

OFFICES, 19, MANCHESTER BUILDINGS, WESTMINSTER, LONDON.
London, Oct. 10, 1860. Hours from Ten till Four. J. V. BASTIER, C.E.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

BUTLIN'S APPARATUS FOR SUPERHEATING STEAM,
by which means a SAVING OF THIRTY PER CENT. IN THE CONSUMPTION OF FUEL IS EFFECTED, TWENTY-FIVE PER CENT. LESS WATER IS REQUIRED TO FEED BOILERS, A GREAT INCREASE OF POWER IS OBTAINED, AND THE BOILER IS RENDERED MORE DURABLE. The above patent can be applied to any boiler, either new or old, and to every description of engine. Most extraordinary reports have been received from parties who have used it, equally satisfactory to the following letters, and any further particulars may be obtained by applying to the patentee.

W. BUTLIN, VULCAN WORKS, WESTON STREET, NORTHAMPTON.

TESTIMONIALS.

DEAR SIR.—Having applied your patent steam superheater to the boiler of our steamship, *City of Nantes*, we have great pleasure in being able to state that your apparatus effects a saving of at least 30 per cent. in the consumption of fuel, besides giving additional speed upon the screw. We do not hesitate in giving our opinion that your invention is a most important one, and one which must come into general use. We approve of your arrangements for admitting saturated steam with the superheated, to regulate the temperature at pleasure. Your plan of filling the heater with water during the time steam is being got up we think is quite a new idea, and remedies one of the great objections to superheaters generally—the rapid destruction of the tubes by the fire while steam is getting up. You are at liberty to make what use you please of this letter, as we think so valuable an invention ought to be made known to the steam shipping interest of this country. We are, dear Sir, yours truly,

W. Butlin, Esq., Northampton. LANGTON AND WILSON.

Little Houghton, Northampton, July 29, 1861.

DEAR SIR.—We have given our engine a sufficient test, both in thrashing and sawing, since the introduction into it of your superheater, to enable us to speak confidently of the great improvement made by the alteration. We believe that your advertisements do not exaggerate the excellence, in any respect, of your patent. Many respectable parties who witnessed the working of the engine are willing to bear testimony to the truth of our statements. We remain, dear Sir, yours very truly,

SMITH AND THURSTON.

Naseby, Northampton, Aug. 24, 1861.

SIR.—I have much pleasure in being able to state that since your patent steam superheater has been applied to my engine I find a considerable reduction in the consumption of fuel, much less water is required to feed it, and a great increase of power is obtained. I am much pleased with the alteration. Yours truly,

L. WILFORD.

Earl's Barton.

SIR.—I am well satisfied with the alteration made in my engine, as it takes less coal and water since your heater has been introduced into it.

Yours truly, CHRISTOPHER COLEMAN.

MESSRS. KNOWLES AND BUXTON, CHESTERFIELD,
MANUFACTURERS OF PATENT TUBULAR TUYERES.

Having been very successful in MANUFACTURING and REPAIRING the PATENT TUBULAR TUYERES, and securing our patent for a further term of years, we have great pleasure in offering them to the public, at a considerable REDUCTION IN PRICE. Our manner of repairing will make them as LARGE and GOOD AS WHEN NEW (which is not the case with the ordinary tuyere) for half the first cost, when there is not more than two coils destroyed at the nozzle, all parties returning them by post paid, and are confident they will be the cheapest and best ever offered to the mining world.

The PATENT TUBULAR TUYERES having maintained a most honourable reputation since their introduction, and been thoroughly proved to answer all the purposes set forth by the proprietors (when properly treated), it is, therefore, deemed unnecessary to publish a list of the patrons, or enumerate cases of their success. Although by such a procedure very much might be said in their favour, yet the readers would never be so fully convinced of their sterling worth as by a practical trial.

The future scale of prices will be as follows, including sockets:—

No. 1 Tuyere, 16 in. long	29s. each.
No. 2 " 18 "	32s. "
No. 3 " 20 "	35s. "
No. 4 " 22 "	38s. "
No. 5 " 24 "	40s. "

Delivered at Chesterfield station. Terms, nett cash quarterly.

PATENT BITUMINIZED GAS, WATER, AND DRAINAGE

PIPES.—These PIPES POSSESS all the PROPERTIES NECESSARY for the CONVEYANCE OF GAS AND WATER, and also for DRAINAGE PURPOSES—viz., GREAT STRENGTH, GREAT DURABILITY, and PERFECT INOXIDIZABILITY, and being non-conductors are not affected by frost, like metal pipes. They are proved to resist a pressure of 220 lbs. on the square inch (equal to 600 ft. head of water), are only one-fourth the weight, and considerably cheaper than iron pipes. They are made in 7 ft. lengths, and the joints are simple and inexpensive. These pipes have been in use in France, Spain, and Italy nearly three years, where the demand for them is very great. The opinions of the press on a public test at the Houses of Parliament, before a large number of engineers and other scientific gentlemen, may be had, with further particulars, at the office of the company, on application to Mr. ALEX. YOUNG, 14A, Cannon-street, London, E.C., where sample pipes may be obtained for trial.

GAS AGAIN.—Another fearful fire, at No. 5, Richard-street, Limehouse-fields, caused by an escape of gas. This could not have occurred had one of HUGHES' PATENT SAFETY ATLAS INDICATING CHANDELIERS been used. All persons having gas fitted should, therefore, have the IMPROVED ATLAS CHANDELIERS FIXED. Kept in stock by all gas-fitters. Drawings free by post, and a large stock always ready for the trade and merchants at the Atlas Works, No. 94, Hatton-garden.

R. H. HUGHES.

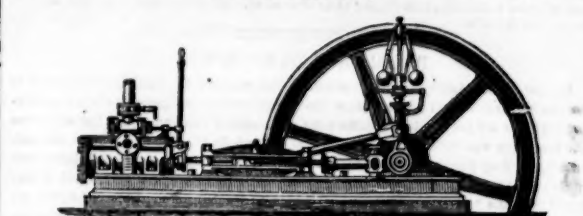
EXTRAORDINARY BARGAINS IN FIRE-PROOF SAFES.—

The directors of a Provincial Insurance Company having recently amalgamated with a London office, have no further use for a number of wrought-iron fire-proof safes and deod chests, now lying at their chief and branch offices. They were all made to order in November, 1860; are WARRANTED FIRE and BURGLAR-PROOF, and through quite equal to new, will be sold for about HALF THEIR COST. The manager will send on application a description of the various sizes, internal fittings, cost, and present price of each safe; and to remove the obvious doubt as to the genuineness of the safe, it is requested that intending purchasers will, in no instance, remit the money until the safe is received. They will be sent carriage paid, and if not found in all respects perfect, may be returned.—Address, The Manager, Insurance Office, 47, Bath-row, Birmingham.

WOTHERSPOON'S SCOTCH WHISKEY can now be supplied

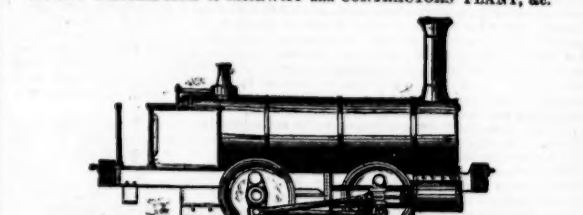
genuine as in Scotland, at WOTHERSPOON, MACKAY, AND CO., 8, QUEEN STREET, E.C., in single bottles, or in quantity, price 3s. 6d. per bottle; 42s. per dozen.

MESSRS. E. PAGE AND CO.,
VICTORIA WORKS, REDFORD,
AND LAURENCE POUNTNEY PLACE, CANNON STREET, LONDON,
MANUFACTURERS OF



HIGH PRESSURE STEAM ENGINES,
from 2½ to 30 horse power, and upwards, adapted for MINING and GENERAL PURPOSES. Prices and full particulars sent on application.

LOCOMOTIVE, STATIONARY, AND PORTABLE
STEAM ENGINES.
CONTRACTORS' WAGONS, DOBBIN CARTS, BARROWS, and EVERY DESCRIPTION OF RAILWAY and CONTRACTORS' PLANT, &c.



CHEAP LOCOMOTIVES for MINERAL RAILWAYS and OTHER PURPOSES.
HUGHES AND MARCH, ENGINEERS and MANUFACTURERS OF RAILWAY PLANT, and EVERY KIND OF MACHINERY, FALCON WORKS, LOUGHBOROUGH.

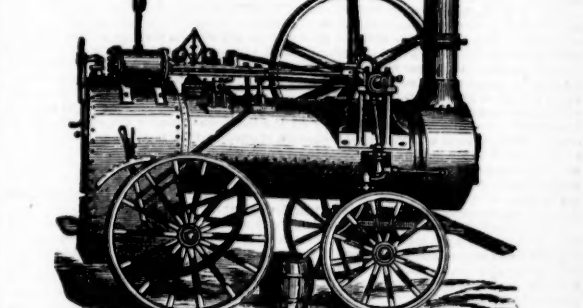
These engines are exceedingly useful in all cases where heavy loads have to be carried up steep inclines. They are fitted in the best style, and with every requisite. Messrs. HUGHES and MARCH, Falcon Works, Loughborough; or E. EDWARDS, Esq., C.E., 13, Beaufort-buildings, Strand, London.

MAKERS of the IMPROVED HORSE ENGINE, by which full power of the horses is given out without friction. It is applicable in all cases where horse power is required. SECOND HAND PORTABLE STEAM ENGINES.

PORTABLE STEAM ENGINE COMPANY (LIMITED).

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PATENT PORTABLE STEAM ENGINE, WITH REVERSING GEAR.

PORTABLE STEAM ENGINES LENT ON HIRE, from 4 to 25 horse power.

Every information can be obtained on application to Mr. DUNSFORD, at the City office, or to Mr. CRISWELL, the company's engineer, at the depot.

PATENT PLUMBAGO CRUCIBLES.

The crucibles manufactured by the PATENT PLUMBAGO CRUCIBLE COMPANY have been in successful use for many years by some of the largest ENGINEERS, BRASSFOUNDERS, and REFINERS in this country and abroad. The great SUPERIORITY of these melting pots consists in their capability of melting on the average 35 to 40 pourings of the most difficult metals, and a still greater number of the ordinary character, some of them having actually been worked for the EXTRAORDINARY number of 96 heats. They are unaffected by change of temperature, never crack, and become heated much more rapidly than any other kind, thereby SAVING more than FIFTY PER CENT. in fuel, time, and labour. Lasting as they do for such a length of time, the saving of waste is also very considerable.

The company have recently introduced a CRUCIBLE SPECIALLY ADAPTED for MALLEABLE IRON MELTING, the average working of which has proved to be about seven days.

CRUCIBLES for STEEL MELTING are also made, which save nearly 1½ ton of fuel to every ton of steel fused.

The Patent Plumbago Crucible Company likewise manufacture and import clay crucibles, muffles, portable furnaces, &c., stove backs, all descriptions of fire-standing goods, and every requisite for the assayer and dentist.

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